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THE GAS JOURNAL

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A Glance at the Contents—

Gas Company Meetings.

Reports are published to-day of the proceedings at the Annual General Meetings of the following Gas Companies: Bristol, Cardiff, Commercial, Croydon, Portsmouth, South Suburban, and York.

Mr. H. E. Copp Addresses the Juniors.

The President of the Institution of Gas Engineers, Mr. H. E. Copp, gives an inspiring message to the Juniors of the Gas Industry at a Joint Meeting of the Junior Gas Associations, held at the British Industries Fair, Birmingham, to-day. In this Mr. Copp exhorts the Juniors to set to work and study hard so as to equip themselves for the future accomplishments in the best interests of the calling they had chosen.

Erection of a Spiral Holder in an Existing Tank.

This is the subject of an interesting paper by Mr. H. S. Adams, Assistant Engineer to the Bilston Gas Company, read before the Midland Junior Gas Association recently, an extract of which is published to-day. The author gives the specifications required in the first instance and full details of the process of erection, which was undertaken by Messrs. C. & W. Walker, Ltd., of Donnington. The whole work was completed in eight months.

Engineer and Manager Wanted at Rotherham.

As will be seen from our advertisement columns, applications are invited by the Rotherham Corporation for the position of Gas Engineer and General Manager. Applicants must hold suitable engineering qualifications, and have a thorough practical knowledge of modern gas manufacture and distribution, together with commercial experience in a gas undertaking and in the control of staff and men. The salary will be at the rate of £700 per annum.

Technical Assistant for Belfast.

As will be seen from our advertisement columns, applications are invited for the position of Technical Assistant at the Belfast Gas-Works. Candidates must have had practical experience in the control and operation of Glover-West vertical retorts, and the person appointed will be expected to be engaged at the time of appointment in a course of study under the Education Scheme of the Institution of Gas Engineers, with a view to taking the Diploma of the Institution.

Domestic Hot Water Supply.

In a paper before the Wales and Monmouthshire Junior Gas Association on Jan. 24, Mr. W. G. Biggins, of Newport, dealt with domestic hot water supply storage systems. In designing a hot water supply apparatus, stated Mr. Biggins, it would be well to remember that its efficiency will be judged by its ability to provide a satisfactory outflow of hot water at all draw-off taps likely to be turned on during the period of the greatest demand. Therefore, to design a satisfactory hot water system, it is necessary to ascertain, as far as possible, the quantity and temperature of water required during different periods of a busy day.

Gas-Works Statistics.

Mr. Edward Alexander, of the Edinburgh Gas Department, read a paper on this subject on Feb. 7 before the Scottish Junior Gas Association (Eastern District). With the growth in size of the productive undertakings, he said, and the necessity for planning ahead as an integral factor of organization, I feel that, at the present time, the development of some form of standard statistics is specially applicable to the Gas Industry. To be of any use, our collection of data must be carried out continuously, carefully, and methodically; otherwise the conclusions drawn will be fallacious. The collection of the data is really the foundation upon which we are going to build.

The World Position of Nitrogen.

After a visit by over a hundred members of the Manchester and District Junior Gas Association to the Chemical and Metallurgical Corporation, Ltd., at Astmoor, near Runcorn, Mr. G. C. Riley, M.A., B.Sc., and Mr. H. G. Bott, Ph.D., A.I.C., read a paper on the "World Position of Nitrogen." It seems very probable, the paper concludes, that before long the production of organic chemicals will pass into the domain of synthetic chemistry with carbon from coal, oxygen and nitrogen from the air, and hydrogen and oxygen from water as the starting products. If the production of these compounds grows to the extent that seems likely, it is possible that the production of ammonia from nitrogen and hydrogen may become a sideline in the great synthetic chemical industry, and ammonia itself will have completed a cycle, originally a bye-product of the Gas Industry, now a prime product, and later again a bye-product, not in this case of the Gas Industry, but of the synthetic organic chemical industry.

EDITORIAL NOTES

Buy British

GREAT as must be the value of the British Industries Fair in any circumstances, it must this year be hailed with more than usual satisfaction, for national industry was never more in need of national propaganda than is the case at the beginning of 1931. We wish every success to the effort which is, by means of the Fair, at present being made to stimulate the country's trade; we hope that it may prove to be the turning-point in the lane of depression, and show the way to the better things which we all know to be in store for us. Well-reasoned publicity at a time like the present is assured of its reward; and the British Industries Fair represents publicity of a very high order. In both the quality and the quantity of its display, it is gratifying to find our own industry once again so well to the fore.

Telegram—

From: H.R.H. The Prince of Wales.
To: The Right Hon. W. Graham, M.P.

Read on Monday night at the Guildhall Banquet in connection with the Fair.

"On the opening of the 17th British Industries Fair, I send my best wishes for its success. Though I am a long way from England, I remember with pleasure past visits to the Fair, and in particular those years when I was able to propose the toast of the Fair at its inaugural banquet. I welcome the inclusion this year of an exhibit of the Cotton Textile Industry, and congratulate the exhibitors on their foresight and enterprise. I share the opinion which I am told the Chelmsford Committee expressed that the Fair can, and should, be made a truly national manifestation of the quality and range of British products, and an increasingly powerful factor in the expansion of our trade."

To the casual visitor, the part that gas plays at the Castle Bromwich Fair might seem to begin and end with the special Gas Section; but in actual fact we find that town gas enters more widely than this into the Fair organization. Over 40,000 c.ft. of gas per hour is consumed in the Fair Buildings, when open. For the two weeks of the Fair it is as if a suburb of 1500 houses had suddenly sprung into existence to vanish again in a night. This represents a distribution problem of some little magnitude, especially as the Fair Buildings are situated on the outer limits of the supply area.

To ensure a regular and adequate pressure throughout the Fair, the gas entering by means of a 12-in. service from the street main is boosted by means of two Keith-Blackman fans driven by a "National" gas engine. These fans raise the pressure of the gas to 27-in. water gauge. Gas at this pressure passes into a 10-in. main running the entire length of the Fair Buildings, with tee-pieces at convenient points. The gas is governed-down as it enters the buildings on its way to the various kitchens, offices, or individual stands. Connections are also taken off this supply main to two Keith-Blackman compressors and two Bryan-Donkin compressors, to give a supply to the overhead high-pressure gas lamps by which the greater part of the Fair is illuminated.

In all directions from this main supply pipes are run, several miles of pipes from 3-in. diameter downward being used. There are seven kitchens in different parts of the Fair Buildings, and in all these—with the exception of the one adjoining the Electrical Section—gas is the fuel employed. In these kitchens over 200 gas cookers, roasters, vegetable boilers, and other canteen equipment have been installed, and the consumption to the kitchens is greater than to any individual stand. Many exhibitors, however, are large consumers of gas, several of them requiring as much as 2000 c.ft. per hour. Gas has been installed on the stands of over 100 of the exhibitors.

In addition to all this, the Fair Authorities themselves are large gas consumers. Over 100 gas fires and panel heaters have been installed for warming the Executive offices, cloak rooms, dining rooms, and Conference Hall. Gas is also very largely used for the general illumination of the Fair Buildings. Experience has shown that it has peculiar advantages as an illuminant, as its use prevents downward currents of cold air which would lead to much discomfort, especially having regard to the fact that the Fair is held during a very cold period of the year. In the main buildings this general illumination is carried out by 1000 and 1500 candle power high-pressure gas lamps, supplied with gas at an approximate pressure of 6-in. mercury. In the dining rooms and kitchens 6-light and 3-light low-pressure lamps are used. Gas lamps are also employed to illuminate the roadways outside the Fair Buildings.

Knowledge is Power

NEVER have the Junior Organizations of our industry, and individual members of these organizations, been more encouraged and helped practically by the Parent Institution and by Seniors generally, than is the case to-day. This encouragement is, we suggest, in part a necessity in view of the keen competition which has to be faced from electricity, oil, and coal at the present time, but in part it is also an act of grace. The seniors are, in fact, devoting their attention to the subject of education of the younger members in a manner which goes far beyond the claims of immediate necessity—in a manner which should not only increase the juniors' desire to study to make themselves and the industry they serve more capable and efficient, but should also enhance their faith and enthusiasm in an important and virile public utility. To-day, in the President of the Institution's address to the Junior Associations at the British Industries Fair, we have an excellent example of this encouragement and inspiration.

The gas industry is undergoing a gradual transformation. Mr. Copp submits that high-pressure distribution over relatively large areas through steel mains from central gas-works is bound to come in this country, and that we must have more men with the necessary technical knowledge to deal with the problems involved. The juniors of the gas industry to-day may have mixed feelings concerning this transformation. It implies that, as smaller undertakings become merged in larger ones,

and as these larger ones in their turn combine, there will be fewer men "at the top." For those possessed of the parochial spirit, this must appear to be a distressing change. But there is no room for the parochial spirit either in the gas industry or in other industry; modern economic conditions have to be met, and technical advances must be applied, and not pigeon-holed in the archives of laboratories. Neither is there any room for despondency on the part of the young men who have lately entered, or are about to enter, the ranks of our industry. There may be fewer "top" places; but there is a host of "middle" places—positions of a new order, of high status, and which demand new knowledge.

Splendid opportunities exist, for technical men of good education, in all three departments—manufacture, distribution, and sales—of the gas industry; and Mr. Copp explains what he means by men of good education. He defines education as a necessary means of acquiring powers of observation and the science of applying such powers to practical uses. "From observation in true perspective we are able to exercise our faculties of deduction, so that when we possess such accomplishments we may lay claim to have acquired some measure of education." He exhorts the young men in the gas industry to study hard to equip themselves for the future, in the knowledge that a prosperous gas undertaking can and undoubtedly will offer to all responsible officials who contribute with loyalty and enthusiasm to its success an adequate salary and an attractive position in life.

More and more the gas industry will depend upon its salesmen, particularly as the employment of gaseous fuel expands in industry; and its salesmen will have to be salesmen-engineers, or at any rate salesmen-technologists. Such men will be able to command salaries which their capabilities of assisting the development of the gas industry merit. And the facilities for training in all branches which the industry and the Universities—especially the University of Leeds—offer to young men now are remarkably generous and well considered. As Mr. Copp points out, the Institution of Gas Engineers regards the interests of the members of the Junior Associations as of the highest importance; and a very large proportion of the matters which come before the Council for consideration have a direct bearing upon the welfare of members of these Associations. The aim of the Institution is to encourage young men to cultivate original thought, and to give expression to such thought in the interests of the future development of the gas industry.

Finally, we make no apologies for quoting Mr. Copp's impression of the exhibit of the Gas Industry at the British Industries Fair at Castle Bromwich: "The first thought which occurred to me was whether we, as representatives of the gas industry, are making as much use of the general trend of scientific development as many other industries are apparently doing. After careful thought, and with what I may describe as a somewhat intimate knowledge of the work which is being carried on, I venture to think that we are."

Mr. Morrison Replies

THE Minister of Transport would appear to be labouring under a feeling of injustice with regard to the protests of the gas industry against his perpetual efforts on behalf of electricity—judging by the reply which he made last Thursday, suitably enough, at the annual dinner of the Institution of Electrical Engineers. As the protest of the gas industry also arose from a sense of injustice, it looks as though one side or the other is in the wrong; and we suggest that it is Mr. Morrison. The gas industry is under the impression that it is Mr. Morrison's duty, as a Minister of the Crown, to see that the scales are evenly balanced; Mr. Morrison regards it as his duty to "urge on all the industries for which he answers in Parliament that they should be efficient and progressive," and in doing this he has acted the part of a propagandist of electricity, to the detriment of gas. He has, indeed, gone far beyond committing, as he puts it, "the heinous offence of encouraging the industry for which he is to some extent responsible in Parliament to go boldly forward in development, in confident expectation of a brighter future." In his reply, Mr. Morrison stated that he had been recently the subject of criticism by the Chairmen of two great gas undertakings, and we would wish him to read again with care the speeches referred to, and so satisfy himself of the reasonableness of the complaint of the gas industry.

It will be noted that Mr. Morrison declares that he has been careful to point out in his various speeches that "they were not made for the purpose of checking or seeking to supplant the great gas industry, which, he had always been ready to admit, was one of the most progressive industries in the country." Now that it has been thus brought to his attention that such speeches must have an effect which he says they were not intended to have, is it too much to expect that there will be no more of them? Should that be the result of the vigorous criticism that has been entered, well and good; but if the "Ministerial boosting" of electricity is continued on the lines to which objection has already been taken, the gas industry must be unceasing in its efforts to secure fair play. It should be remembered, as is pointed out by a correspondent to the "Financial Times," that, "as matters stand, the electrical industry has rationalized itself with Government support and goodwill. The Government will not allow the gas industry to rationalize itself, because it will not introduce the necessary legislation freeing it from the antiquated regulations under which it works."

Mr. Morrison and his colleagues should be permitted no haziness as to the views of a century-old public servant with regard to this plan of "robbing Peter to pay Paul," which is what depriving the gas industry of employment to give it to the electrical industry would really amount to. There is not in this instance even the excuse that Paul is able to make better use than Peter of what is being taken from Peter for his benefit. Of this Mr. Morrison can assure himself, if he will but study a graph contained in a handsome brochure entitled "The Harnessed Flame," which is a record of progress recently issued by the Gas Light and Coke Company. This graph illustrates what is produced from a ton of coal, in the first place when carbonized by the Gas Light and Coke Company, and, secondly, by a modern electric generating station. In the gas-works there result 8,400,000 heat units in gas, 9 cwt. of coke, 11 gallons of tar, 25 lbs. of fertilizer, and 80 lbs. of ashes. In the electric generating station there are produced 6,000,000 heat units in electricity and 224 lbs. of ashes. Consideration of these facts may modify Mr. Morrison's and the Government's view "that, especially in these times of depression, they are bound and entitled to urge the electrical industry forward in the developments *which would bring advantage to the country*." The italics are ours.

It is not upon the Government and Mr. Morrison only that the point just made should be impressed—together with the other important matter of cost. Readers will recall that in the "JOURNAL" Correspondence columns a fortnight ago Mr. W. R. Herring expressed the view that the general public must be impressed by the fundamental difference between the relative merits of the two services, gas and electricity. Here is what Mr. Herring had to say: "I am not satisfied that the gas industry is exploiting this point as effectively as it should do. It is not sufficient that we inside the industry should be convinced; we must also convince that elusive entity 'the man or woman in the street' by constant and unwearying reiteration of the fact, and as we are in touch, by means of the accounts, with some nine millions of the public three or four times a year, a few effective paragraphs fairly contrasting the merits of the rival services will be well worth while. It is not desirable that we should take up other than a cold comparative attitude." There is, indeed, no need to do so.

We believe that there are undertakings which already do something of the kind suggested by Mr. Herring, and if the plan were universally adopted it should prove an efficient counterblast to propaganda on behalf of electricity of the sort to which objection is now being taken by the gas industry. In any case, it is only right that the public should have impressed upon them the real facts.

Tied Houses

THE third point in Mr. Morrison's reply deals with what he says is an " even wilder " charge against him than the other two. Well, the " JOURNAL " pages will be found to contain evidence in support of the contention that Municipalities have been discouraged from adopting the course which some have adopted in excluding gas from Council Houses in favour of the electricity which they themselves supply. Mr. Morrison, it may be noted, says: " It is a complete misapprehension to suppose that any exclusion of gas from houses erected by local authorities is the result of any suggestion from the Minister of Health, and I can state with equal definiteness that any such exclusion has never been the result of any suggestion by the Minister of Transport." As to this, is it or is it not the fact that, as stated by Dr. Charles Carpenter, when addressing the proprietors at the meeting of the Commercial Gas Company, and again in similar circumstances at the meeting of the South Suburban Gas Company (both of which meetings are reported in this issue of the " JOURNAL "), that: " In July of last year, during the debate on the Housing (No. 2) Bill in the House of Commons, an endeavour was made to obtain the insertion of a clause which would give the tenants of Council Houses the free choice of the form of light and heat to be used by them, but such was our legislators' idea of fair play and justice that the suggestion was received with derisive laughter? " Again, on several occasions during the past twelve months we have reported pointed questions in the House of Commons, and replies to them which have done nothing to dissuade zealous Municipalities owning electricity undertakings from turning Council Estates into " tied houses," in respect to the supply of their particular commodity.

On a later page of this issue there will be found a recommendation by the Housing Committee of the London County Council in these terms:

> " That, as far as possible, it is desirable, provided that no additional charge on the rates is involved thereby, that equal opportunity should be given to gas companies and electricity supply authorities to install their services in the Council's dwellings, and that the Council's tenants should be afforded freedom of choice in the use, whenever available, of gas or electricity, or both."

This recommendation follows an intimation that letters have been received from the South Metropolitan Gas Company and the Commercial Gas Company offering, as regards all the Council's dwellings in their respective districts of supply, to lay the necessary mains and service pipes and to carcase the dwellings with pipes for a supply of gas for lighting, heating, and cooking, free of charge to the Council, on condition that each tenant should have freedom of choice to use gas or any other form of energy which may be provided for any or all of such purposes.

Incomplete Combustion

IN these columns last week we commented on a paper on this subject which was read by Mr. E. W. B. Dunning, of the Gas Light and Coke Company, at a meeting of the London and Southern District Junior Gas Association. We called attention to the importance of the recent investigations into the mechanism of combustion, and the effects of the products of combustion, which have been carried out by the Gas Light and Coke Company and by the Institution of Gas Engineers, but we omitted to mention the work of Radiation Ltd.—work which has without question been of the greatest value to the gas industry, and to the results of which the " JOURNAL " has on several occasions devoted its pages. Particularly we refer to the intensive study given to this matter by Dr. Harold Hartley and Mr. Hamilton Davies. It is only right that full credit should be given to the firm of Radiation for the development of laboratory technique in the determination of carbon monoxide, and for the scientific interpretation and practical application of the laboratory results. We regret this omission from our comment last week.

More Electricity

This is the heading to a news item which has been " going the round " of the Press within the past few days. The following is taken from " The Times: " " The official returns rendered to the Electricity Commissioners show that 1,141,000,000 units of electricity were generated by authorized undertakers in Great Britain during the month of January, 1931, as compared with the finally revised figure of 1,079,000,000 units in the corresponding month of 1930, or an increase of 5·7 p.ct." Statements of this kind have the effect of keeping electricity in the public eye.

And Gas.

See how well a statement made last Friday by Dr. Charles Carpenter, when presiding at the meeting of the South Suburban Gas Company, compares with the above: " The increase in the sales of gas in the current year to date as compared with the corresponding period in 1930 is a little over 11 p.ct., so that we are still doing some business in the supply of gas."

Further Reflection for Mr. Morrison.

Proposing the toast of " His Majesty's Ministers " at last week's annual dinner of the London and Suburban Traders' Federation, Sir Francis Goodenough said, referring to Mr. Morrison's propaganda for the industry with which gas (which has done such wonders for the working-class population of these islands) is in keen competition in certain directions: " I am sure that all the traders here represented will share our view that such partisan advocacy for one trade against another is not what the traders of the country as taxpayers pay Ministers to spend their time upon; and I hope Mr. Morrison, for whom personally I have long-standing regard, will quickly moderate his transports on behalf of electricity, and stick to his true job of administering his Department."

Decentralizing the Selling Side.

After referring, at last week's meeting of the South Suburban Gas Company, to the agreement between that Company and the South Metropolitan Gas Company, Dr. Charles Carpenter (the Chairman) said that in the South Suburban area they were altering as far as possible in the direction of decentralizing the selling side of their business, making this as much as they could a more local matter, although the central organization at Sydenham would be the source from which all supplies would be taken. He added: " This denotes, you may consider, somewhat of a reaction from the policy of amalgamating the several undertakings which go to make up the Company as it exists to-day; but, as you will see, while we manufacture and distribute in a wholesale manner we sell in a retail way, and this is the fact which we have continually to bear in mind in the case of our large area of scattered centres of consumption."

Forthcoming Engagements.

Feb. 20.—Joint visit of B.C.G.A. GAS SALESMEN'S CIRCLES to the British Industries Fair, Birmingham.

Feb. 20.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting at 2.30 p.m. at 28, Grosvenor Gardens, S.W. 1.

Feb. 24-26.—JOINT GAS CONFERENCE at the British Industries Fair, Birmingham.

Feb. 27.—GAS COMPANIES' PROTECTION ASSOCIATION.—Meeting of Committee, at 5, Victoria Street, S.W. 1, at 2.30 p.m.

March 5.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Annual general meeting at the Grand Hotel, Birmingham, 2.30 p.m.

March 6.—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.—Annual Meeting, Midland Hotel, Manchester, at 2.30.

March 10.—NATIONAL GAS COUNCIL.—Meeting of Central Executive Board, 28, Grosvenor Gardens, S.W. 1.

March 19.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Annual General Meeting at the Hotel Metropole, Northumberland Avenue, W.C., at 2.15 p.m.

PERSONAL

A FAMILY RECORD.

The current issue of the "Bulletin" of the Luton Gas Company refers to the long service which the family of the present General Manager, Mr. W. Phillips, have given to the Company:

"Mr. William Phillips, grandfather of the present General Manager, took charge of the works in 1844. Since then the aggregate service of four members of the family totals 202 years—an average of 50½ years. By a strange coincidence, Mr. Phillips' father and grandfather each had 45 years' service. Mr. Phillips has been with the Company 42 years. The fourth member of the family, Mr. Charles Phillips, uncle of the General Manager, has been with the Company 70 years, a record which must be outstanding in the industry. To-day, at the age of 84, he walks to and from the works three times daily. His health and vitality are remarkable for a man of his years."

Mr. THOMAS SCOTT, Works Foreman of the Kelty Gas Company, has been appointed to the position of Manager to the Leslie Gas Company, Fife.

We understand from Messrs. Alexander Duckham & Co., Ltd., of 16, Cannon Street, E.C. 4, that Mr. ALEXANDER DUCKHAM has sailed on a visit to his firm's oilfields in Trinidad.

Messrs. G. R. Cawood & Co., Ltd., of 200, High Holborn, W.C. 1, announce that Mr. H. TOBIN has been appointed as their representative in the Midlands and South. He was formerly with Messrs. James McKelvie & Co.

OBITUARY

The death took place in a London nursing home, on Feb. 12, after a severe illness, of Mr. Frank William Randall, J.P., of Ryde, the Chairman of the Ryde Gaslight Company. Mr. Randall, who was 70 years of age, was a well known and much respected public man in the town, and until 1920 he had served as a member of the Town Council, and was a former Mayor. He joined the Board of the Ryde Gaslight Company in 1907, and became Chairman in 1917. At that time the output was 82 million c.ft.; to-day it has reached over 200 millions and the works have been equipped with up-to-date machinery. Deceased was instrumental in inaugurating a co-partnership scheme which, since it commenced in 1927 with a gift to the co-partners of £500, has been most successful. The total paid in profits to date amounts to £2313, which, together with deposits, gives the co-partners a holding of well over £3000.

Mrs. SIMMANCE thanks all Mr. Simmance's friends for their kind expressions of sympathy, and begs them to receive this notice until she can answer letters individually.

CORRESPONDENCE

Municipal Tyranny

SIR,—The powers of local authorities have been greatly increased since the war, and not always, I fear, to the advantage of peaceful citizens, especially those who live on housing estates under the control of municipal authorities who themselves generate a form of heating and lighting power.

These unfortunate folk, before they can obtain a house, are called upon to sign agreements which would create a tremendous outcry if they were put forward by private landlords. Under these agreements the playing of music, the keeping of pets, and the fixing of brass-plates on the front-door may be forbidden, and the limit is reached when a clause is inserted stipulating that a tenant shall only use that particular medium of heating and lighting which the landlord himself supplies.

This pernicious restriction was imposed upon tenants on the L.C.C. housing estates, but I understand that protests on the score of the high cost of electricity for domestic purposes have resulted in the appointment of a sub-committee to reconsider the matter.

Ever since Magna Charta this country has stood with pride for the principle of the liberty of the subject, but this official attitude of dictatorship to housewives in the management of their homes is nothing short of tyranny.

As the housing estates to which I refer are mainly occupied by the working man and his family, many of whom are members of the General and Municipal Workers' Union, I feel compelled to lodge an official protest against this state of affairs.

May I urge that other municipal authorities should follow the example of the L.C.C. and reconsider any such restrictive clauses as may be inserted in their agreements, so that they may regain their reputations as fair and unbiassed administrations.

W. THORNE, General Secretary.
National Union of General and Municipal Workers,
28, *Tavistock Square, W.C.* 1,
Feb. 10, 1931.

Review of Basic Price Legislation

SIR,—With reference to my article under the above heading in the "JOURNAL" for Jan. 21, Mr. Ridley points out that there are some inaccuracies in the table relating to the Newcastle Act of 1929. The selling price in the year of the Act should be 8d., and not 8·5d. This is a typing error.

With regard to the restriction of dividends, it is clear from the table that the price referred to is in relation to the principal district, but the dividend cannot exceed 5⅝ p.ct. if the price is above 8d. in this principal district. Therefore the words "below 8d." should be "8d. or below."

With regard to the amount of 2s. 6d. slide on the equivalent 5 p.ct. stock, I regret that I included the preference stock in this computation. For the purposes of this table I will assume that the Newcastle dividend of £5 3s. 9d. p.ct. for the year 1928 is for all practical purposes a 5 p.ct. stock, and therefore the old increment of 2s. 6d. is equivalent to £2577. It must not be overlooked, however, that the standard dividend was 3½ p.ct., and therefore, if the stock were converted to a 5 p.ct. standard stock in the ratio of 7 to 10, the 2s. 6d. increment in the converted stock would be only 7/10 of £2577. For the purpose for which the table was drawn out, however, this further adjustment need not be made.

GEO. EVETTS.

159, *Palace Chambers,*
Bridge Street, Westminster, S.W. 1,
Feb. 14, 1931.

THE NEWS OF THE WEEK

Gas and Electricity in L.C.C. Dwellings.

Reference to this matter is made in the last Report of the Housing Committee of the London County Council.

"There has," it is stated, "recently been a considerable agitation by workers in the gas industry, who suggest that the Council ought not, by the arrangements it makes, to prevent the gas companies from supplying gas for lighting to those tenants who may prefer that form of illuminant. Statements have appeared in the Press and in many letters that the Council itself prohibits the use of gas in its houses. This is by no means true, since the general principle adopted during the past three years has been to use electricity for lighting and gas for cooking and heating in its dwellings."

The report goes on to say that, "from the point of view of consumption, much more gas is usually consumed for the purpose of cooking and heating than for lighting. It was, therefore, not unreasonable to assume that the system which we adopted was by no means unfair and certainly did not exclude or prohibit the use of gas in the Council's dwellings. We were satisfied that on balance the arrangements benefited the gas industry rather than otherwise.

"It has been represented to us, however, that the consumption of gas for cooking without a lighting load results in the formation of peak loads, the heaviest of which occurs at the mid-day period when dinners are being cooked. In all cases of negotiations with the gas companies and the electricity supply authorities, one of the main considerations of the Council has been the interests of the tenants, both from the financial point of view and from the point of view of convenience and comfort; but it is true to say that the tenants, with certain exceptions, have not been able to choose which form of illuminant or heating agency they desire.

"We have considered whether under present conditions it would be practicable in the case of all new dwellings of the Council, where arrangements have not already been entered into, to afford each tenant the choice of either gas or electricity, and we have examined the question from two points of view: (1) Whether it would be reasonable to afford equal opportunities to the gas and electricity undertakings in the supply of their services to the Council's tenants, and (2) whether it would be a practicable arrangement from the Council's point of view as landlord and in the management of its estates.

"Letters have been received from the South Metropolitan Gas Company and the Commercial Gas Company offering, as regards all the Council's dwellings in their respective districts of supply, to lay the necessary mains and service pipes and to carcase the dwellings with pipes for a supply of gas for lighting, heating, and cooking, free of charge to the Council, on condition that each tenant should have freedom of choice to use gas or any other form of energy which may be provided for any or all of such purposes. It will be seen that these gas companies are prepared to carcase all the houses built by the Council in their districts and to take the risk involved by the tenants' choice. We do not think it is unreasonable to suggest that the electricity supply authorities should be placed on the same footing, by which means they and the gas companies would have equal opportunity of competing in the supply to tenants of electricity or gas whether for lighting, cooking, or heating. From the Council's point of view as landlord, and from the point of view of estate management, we see no insuperable objection to such an arrangement, assuming that the gas companies and the electricity supply authorities are both ready to carcase or wire the dwellings for their respective services. They would each be furnished with the names and addresses of incoming tenants, and would thus be afforded equal opportunity to supply the tenants' requirements. There should be ample opportunity in the interval between the time the tenant selects the house he will occupy and the day he goes into occupation to enable all arrangements to be made for the supply of meters, fittings, &c. Where, in the case of a change of tenancy, the new tenant expresses a wish to choose a different means of lighting, cooking, &c., there should be no difficulty in the removal of the fittings of one company and the fixing of those of the other. We appreciate that if the supply of one or other service is not available the system cannot be operated, but we have little doubt that in London and Greater London it should always be possible to obtain adequate supplies of gas and electricity. Furthermore, we think that the arrangement which we suggest would be in the interests of the tenants, as there would be direct competition in the supply to them of gas and electricity. We recommend:

> "That, as far as possible, it is desirable, provided that no additional charge on the rates is involved thereby, that equal opportunity should be given to gas companies and electricity supply authorities to install their services in the Council's dwellings, and that the Council's tenants should be afforded freedom of choice in the use, whenever available, of gas or electricity, or both."

Sir Francis Goodenough on "Ministerial Propaganda."

Speaking at the dinner of the London Suburban Traders' Federation at Whitehall Rooms on Feb. 9, Sir Francis Goodenough referred to the Minister of Transport's propaganda for the use of electricity, and the resentment caused in the Gas Industry.

"I am sure," he added, "that all the traders here represented will share our view that such partisan advocacy for one trade against another is not what the traders of the country as taxpayers pay Ministers to spend their time upon—and I hope Mr. Morrison, for whom personally I have long-standing regard, will quickly moderate his transports on behalf of electricity, and stick to his true job of administering his Department."

The Minister of Transport's Reply to His Critics.

Mr. Herbert Morrison, Minister of Transport, on Feb. 12 replied to the criticisms levelled against him by Sir David Milne-Watson and Dr. Charles Carpenter. He was speaking at the annual dinner of the Institution of Electrical Engineers.

"It appears, in the first place," said Mr. Morrison, "that I have committed the heinous offence of encouraging the electrical industry, for which I am to some extent responsible in Parliament, to go boldly forward in development in confident expectation of a bright future. It is, of course, my duty to urge upon all the industries for which I answer in Parliament, that they should be efficient and progressive.

"Against this charge I have no defence, if, indeed, any defence is required. I can only say that I have been careful to point out in my various speeches that they were not made for the purpose of checking or seeking to supplant the great Gas Industry, which, I have always been ready to admit, is one of the most progressive industries in the country.

"Indeed, I have quoted the example of the enterprising spirit with which the Gas Industry have attacked their problems, to point a moral to the electricity supply industry. I think I may claim that I have always made it perfectly clear that there is room for both industries.

"The next charge brought against me is that I have stated that I live in an all-electric house. My only purpose was to show that I practised that electrical efficiency I was urging upon the industry. This has been interpreted as being a peculiarly insidious attack on gas!

"The third item in the charge against me is even wilder than the other two.

"It appears that certain municipalities have, in certain of their housing estates (for reasons which they no doubt consider adequate), provided for the use of electricity for heating and lighting, as in other cases they have provided for the use of gas for these purposes, and it has been alleged that 'in some way or other this attitude may have been inspired in some measure by Whitehall.'

"It is a complete misapprehension to suppose that any

exclusion of gas from houses erected by local authorities is the result of any suggestion from the Minister of Health, and I can state with equal definiteness that any such exclusion has never been the result of any suggestion by the Minister of Transport.

"I have thought it right to take this early opportunity of making clear the Government's position and my own. It is briefly that, especially in these times of depression, we are bound and entitled to urge the electricity industry forward in the developments which will bring advantage to the country."

Boosting the Grid.

The following Editorial Comment appeared in the "Colliery Guardian" for Feb. 13.

"We all of us hope that the national electrical scheme may prove a success—indeed so far have we gone with it that failure now would be little short of a calamity—but the means adopted recently by the Minister of Transport to advertise the scheme are unseemly, to say the least, and we are not surprised that the gas industry is up in arms.

"Mr. Morrison has openly donned the apron of the salesman and at meeting after meeting up and down the country he has been the protagonist in 'an active publicity campaign' which in some cases stops not far short of coercion. When the fairness of his attitude was challenged, Mr. Morrison replied that it was his duty 'as one politically responsible for the electrical industry to further its interests in every possible way.' Yet he expressed the opinion that the South Metropolitan Gas Company was 'employing somewhat undesirable means in furthering the interests of a particular commercial undertaking' when they took up the cudgels for their workmen, who desired to reserve the option of using gas or electricity in their homes. It has been pointed out that in nearly 100,000 municipally-owned houses in this country all freedom of choice is denied to the tenants, whilst in thirteen areas the local authorities have prohibited the use of gas altogether, and in 47 others the use of gas for specific purposes is forbidden. Can we trace any connection between this taboo and Mr. Morrison's campaign? And is the latter in any way responsible for the delay in promoting the promised legislation for the gas industry?

"Dr. Carpenter very pointedly suggests that apparently things which are undignified in the case of a commercial undertaking are quite proper where the politician is concerned. Sir David Milne-Watson holds out the edifying spectacle of a verbal duel between the Minister of Transport and the President of the Board of Trade on the respective merits of electricity and gas, or railways and road vehicles. That is not likely to happen until the State gets its hand also upon the gas industry, in regard to which at present it does no more than exercise a restrictive influence.

"The moral, of course, is that once an important industry is transferred from private ownership to the State or municipality, the taxpayers' money will always be used in the most flagrant fashion to cover up the defects that not infrequently develop as a result of the change. A State administration can ignore the conventions of fair trading which the private undertaker is by an unwritten law compelled to observe.

"On only one point do we disagree with Dr. Carpenter—he says that it is more difficult to advertise gas than electricity; if that be so, the gas companies have shown a remarkable ability to overcome their handicap."

Gas in Council Houses.

The following letter appeared recently in the "Times" on the subject of restrictions imposed on tenants of council houses from Mr. D. G. Somerville, M.P. for East Willesden:

Complaints are made by the Gas Industry that, in certain council houses, autocratic local authorities prohibit the use of gas in any form, or limit it in a restricted form, often because they have an electricity undertaking of their own. The Government, when questioned, explains its disinclination to do anything by way of redress on the ground that the matter is one solely for the local authorities. But is it? These council houses are partly financed by the taxpayers' money, and I do not, therefore, see why the taxpayers should be called on to assist in boosting one illuminant against another.

I hold no brief for either, but I do think that each is entitled to a square deal, and the tendency of some local authorities is nowadays so autocratic that unless a protest is made at this stage with regard to gas, we shall find additional restrictive covenants put in many leases which no private landlord would dare to insert.

THE NEWS—continued.

The Embargo on Gas.

A Worker's Protest.

The following letter appeared recently in the "Daily Telegraph" over the signature of W. G. Dorset.

The chiefs of two London gas companies have protested against the restrictions on the use of gas by various local authorities, and as a worker I should like to add my protest.

In the past both industries could compete in the open market by laying gas and electric supplies, thereby providing employment for both concerns, and giving the tenants the choice of either commodity for their requirements. As the slums are demolished and replaced by new dwellings built, the conditions imposed, unless removed, must mean the automatic decline of the Gas Industry and its allied trades.

It is not for public bodies to determine what we shall have in our homes. The money for the building of the estates is provided out of public funds, to which gas companies are large contributors, and in justice this restriction must not be allowed to remain on the use of gas. No particular industry should be sheltered to the detriment of others.

Unfair Discriminating Treatment.

The following letter appeared in last Friday's "Times," over the signature of Mr. Louis W. Smith, M.P.:

Every one familiar in any way with the gas industry will sympathize with the complaints of the Governor of the Gas Light and Coke Company that gas cannot for some mysterious reason or another obtain fair treatment at the hands of Government Departments. This industry is carried on under conditions which are quite out of date, and which seem particularly absurd in these days when the doctrine of rationalization is preached by everybody. If the gas industry were only allowed to rationalize itself—and for this legislation is necessary—the value to trade would, I honestly believe, be immediate. We should then see gas expand as much as it does in the United States at the present time; but to do this it will need legislative sanction to charge a two-part tariff. At present gas cannot make a standing charge, *plus* a low rate per unit consumed, as electricity does, and yet there is no reason whatever why there should be any unfair discriminatory treatment.

Removing Restrictions on Gas.

A plea for reparation for the injustice done to the Gas Industry in the past and a suggestion that the Board of Trade should make itself responsible for gas interests was the subject of a recent letter to the "Daily Telegraph" from Mr. George Reynolds, of Golders Green, N.W. 11, who wrote as follows:

Mr. Herbert Morrison has tendered his apologies to the Gas Industry and made some justification of his recent attitude in boosting electricity. This, however, is not enough. The Government must see that reparation is done for the injustice to gas.

This can be effected by legislation releasing the Gas Industry from obsolete restrictions upon its normal development; by granting facilities to charge for gas supplied to industrial undertakings upon a two-part tariff, as in the case of electricity; and by dissuading local authorities from unfair discrimination against the use of gas in Council houses.

If it is Mr. Morrison's job, as he says, to watch over the interests of electricity, it is equally the duty of Mr. William Graham, of the Board of Trade, to do his best for the welfare of the Gas Industry.

Gas and Electricity.

The following letter over the signature of John Brookes was published in the "Financial Times" on Monday last:

"Mr. Herbert Morrison, in his speech at the Institution of Electrical Engineers on Feb. 12, evaded the one serious point between gas and electricity. This point is the need for 'fair play' for each.

"As matters stand, the electrical industry has rationalized itself with Government support and goodwill. The Government will not allow the gas industry to rationalize itself because it will not introduce the necessary legislation freeing it from the antiquated regulations under which it works.

"When the Government adopts the policy of placing both gas and electricity on the plane of equal opportunity, it can then, and only then, claim to be fair to both industries."

THE NEWS—*continued.*

Tenants Win Fight Against Council House Ban.

Following the protest of Dr. C. Carpenter, President of the South Metropolitan Gas Company, against the unfair restrictions which some housing authorities are imposing on their tenants, the Scarborough Town Council have abandoned the idea of evicting a number of householders who had installed gas, contrary to the regulations.

The Corporation, it was stated, owns the electricity undertaking, and the use of this form of power is twice as costly to consumers as gas. It was considered improbable that any judge would, in these circumstances, make an ejectment order.

"Tenants are already paying rents far in excess of those they would have to pay to a private landlord," said Councillor Kipling, urging that the ban on gas should be lifted. "One has always been led to believe that an Englishman's home is his castle. If this policy of restriction is adhered to, his home will become a prison."

"Coming of Age" of the Illuminating Engineering Society.

An occasion which the President (Lieut.-Col. K. Edgcumbe) said might be regarded as the "coming of age" of the Illuminating Engineering Society was the annual dinner and dance which took place on Tuesday of last week at the Trocadero Restaurant; there being some two hundred members and guests present. This remark was made by him when replying to the toast of the Society, proposed by Sir John Brooke. Among those supporting the President at the top table was Sir Francis Goodenough, C.B.E. (Vice-President of the Society), who was accompanied by Lady Goodenough.

Sir JOHN BROOKE, C.B., who is Deputy-Chairman of the Electricity Commission, said he was glad the Society were stressing particularly the scientific side of their activities. It was because the Society were calling the attention of all illuminating engineers to the ideals that they ought to keep before them that their work was so valuable. They afforded a common ground for the discussion of problems. People were really only just beginning to understand the purposes and possibilities of light, in the cases of both shops and public thoroughfares. Now that the streets were being turned, as it were, into railways, it was surely impossible to continue with the present standard of lighting. It was a very dangerous anachronism that a large part of the lighting should be left to be provided by the moving vehicle.

INCREASE IN THE USE OF GAS FOR PUBLIC LIGHTING.

He was told that since 1920 the increase in the quantity of gas used for public lighting had been 19,000,000 therms, or 56 p.ct.—an annual increase of over 6 p.ct. There had also been a little electricity used, but he would not refer to that. [Laughter.] The progress made was very good, but it was not fast enough; and it was because the efforts of the Society were in the direction of still more rapid progress that he was so glad to be present on this occasion.

The PRESIDENT, in the course of his response, mentioned that they had with them that night three or four of the enthusiasts who took part in the formation of the Society, at the instigation of the late Mr. Leon Gaster, twenty-two years ago. Among them was their energetic Hon. Secretary, Mr. J. S. Dow, than whom no man living had done more for the good of the Society. It was appropriate that on their twenty-first birthday the Society should be incorporated. The membership of the Society was now just over 500 of all grades, and it included a large number of foreign experts. In conclusion, he emphasized the necessity for the illuminating engineer to work in close co-operation with the architect.

Proposing the health of the guests, Dr. JOHN W. T. WALSH mentioned among others the President of the Institution of Gas Engineers (who was present with Mrs. Harold E. Copp), the President of the Institution of Electrical Engineers (Mr. C. C. Paterson), and the President of the Association of Public Lighting Engineers (Mr. Thos. Wilkie).

GAS UNFAIRLY TREATED.

Responses were by Sir JOSEPH E. PETAVEL, K.B.E. (Director of the National Physical Laboratory) and Mr. HENRY V. ASHLEY (Vice-President of the Royal Institute of British Architects). Mr. Ashley said he could not help feeling that, by many municipal bodies and the like, gas was not quite fairly treated. It was looked upon by them as rather a "Cinderella." The Society, of course, took account of all methods of lighting, and gas had still a very large function to fulfil.

Lady Goodenough Distributes Prizes.

The Prize-winners of the Cake Competition organized by the London Gas Exhibit Committee at the recent Cookery and Food Exhibition were invited to the Kensington Showrooms of the Gas Light and Coke Company on Tuesday, Feb. 3, to receive their prizes, which were distributed by Lady Goodenough.

On her arrival, Lady Goodenough was presented with a bouquet by one of the Junior Competitors, and Sir Francis, in asking Lady Goodenough to present the prizes to the successful competitors, referred to the high standard of the competition and to the keen interest it had again awakened on the part of the public.

He explained that it had been decided to reduce the number of competitions for Juniors from 3 to 2 and to increase the age limit from 14 years to 16 years, and the entries were commented on by the judges very favourably. Altogether there were very nearly 500 entries.

After the distribution of the prizes, Mr. A. F. Ball, representing the Wandsworth, Wimbledon, and Epsom District Gas Company, moved a hearty vote of thanks to Lady Goodenough for so kindly presenting the prizes, a vote which was received with acclamation and acknowledged with thanks. The company were then entertained at tea.

Large Lancashire Coke Oven Order.

The Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., have received an order from the Lancashire Steel Corporation, Ltd., for a large installation of Becker Coke Ovens complete with bye-product recovery plant. The installation is to be erected at Irlam, near Manchester, in connection with the development of the Partington Steel and Iron Company's steel plant.

A battery of 51 Becker coke ovens is to be built capable of producing 5000 tons of coke per week. The ovens will be so arranged that they may be under-fired by means of blast furnace gas, producer gas, or coke oven gas.

The contract also includes for the supply of coal handling, washing, blending, and screening plant; coke handling and screening plant; bye-product recovery plant; and benzole recovery and rectification plant.

Under normal conditions it is estimated that 750,000 gallons of motor spirit will be produced a year.

Mr. A. W. Smith Speaks on the Birmingham Gas Department.

[From the "Birmingham Post."]

"Few people appreciate the great amount of organization necessary to transfer the heat from a lump of coal on Saltley gas-works sidings to the under-side of a frying-pan at Northfield," declared Mr. A. W. Smith, General Manager and Secretary to the Birmingham Corporation Gas Department, in an address on "Gas Service" to the members of the Birmingham Rotary Club on Feb. 9. Birmingham's Gas Undertaking, he said, was the largest in the country outside London, supplying as it did an area of 140 sq. miles, with 1400 miles of mains, a consumption of 900,000 tons of coal a year, and a gas output of more than 14,000 million c.ft.

The Gas Industry was in some way useful to everyone, he said. Their own Department showed that 3250 local factories used gas for industrial purposes, and there was hardly an industry not assisted by it. Birmingham had a quarter of a million consumers, and, naturally, they got complaints. He hoped they always would do, as his view was that an undertaking that got no complaints was generally moribund.

"To run a large gas undertaking," added Mr. Smith, "is not so easy as, say, running a brewery. No one is panting for our products."

Mr. Smith said that gas making to-day is one of the most interesting examples of scientific, engineering, and chemical principles put into commercial practice that one can meet. The Industry was still battling with the slump in the value of residual products, particularly tar and ammoniacal liquor. The latter, owing principally to the overproduction of ammonia consequent upon the synthetic nitrogen plants installed, was now a definite charge on the Department, instead of bringing in a very lucrative income as it did formerly. Research was being carried out with the object of restoring to the balance-sheet an income

which would enable the Department to cheapen still further the price of gas.

The Department, said Mr. Smith, had been badly hit financially by the tremendous extensions of mains in public highways in outlying parts of the area. "The Gas Committee could find a good opening," he said, "for a prophet who could foretell accurately the layout of this city in twenty years' time."

Gas-Tight Stanton-Wilson Flexible Joint.

The Stanton Ironworks Company, Ltd., near Nottingham, have received instructions from Mr. J. Ferguson Bell, M.Inst.C.E., the General aMnager and Engineer of the Derby Gas Light and Coke Company, to supply a cast-iron main, 16 miles in length, consisting of 12-in. and 15-in. diameter De Lavaud spun iron pipes, fitted at each length with Stanton-Wilson flexible joints, for connecting up their Belper Gas-Works with coke ovens at Clay Cross and Blackwell, for transmitting coke oven gas from batteries of coke ovens situated at these two points.

This installation is of interest in that flexible joints are being used in connection with cast-iron pipes for protecting the main against possible subsidence of the ground, and against vibration resulting from road traffic.

Gas Equipment for South Shields Council Houses.

In connection with the erection of 36 four-apartment houses and 32 three-apartment houses at Stanley Terrace, South Shields, the Borough Engineer stated that the houses are admirably suited for the installation of gas cookers and boilers, and that he had received quotations for supplying and installing such equipment, from which it would appear that a saving of at least £13 7s. per flat in the cost of constructing the houses can be effected. He submitted details of the proposed equipment, which will eliminate the necessity for a Yorkshire range and hot water circulation from the fire. This, in his opinion, will result in a saving in the maintenance of the house, as the hard water in this area causes considerable expenditure in the cleaning and repairing of hot water systems. The Gas Company informed him that they had almost 28,000 prepayment consumers in the district, and that gas cooking apparatus, with gas-heated wash-boilers are fitted in the Jarrow and other Corporation houses.

The Committee decided that the gas heating and cooking installation recommended by the Engineer be provided in the houses.

The Industry in Buenos Aires.

In connection with the forthcoming British Exhibition in Buenos Aires, to be opened by the Prince of Wales, the "Daily Telegraph," on Feb. 16, published a supplement in which were surveyed British Trade conditions, actual and potential, in the South American market.

South America, it is stated, imports British goods worth (excluding re-exports) £53,000,000, and the Primitiva Gas Company are large contributors to this total, placing, as they do, orders for the bulk of their coal, plant, and stores with Great Britain.

In an article in the supplement it is mentioned that, as the main pursuits of the Argentine are agricultural, the Gas Industry is not widespread. A good deal of British capital, however, has been sunk in gas undertakings of a highly progressive kind, of which the Primitiva Gas Company of Buenos Aires, Ltd., is pre-eminent in that it is the only important one that may be judged by European standards.

The war imposed a considerable check upon the Company's fortunes, it is stated, but since the re-organization of capital in 1924 and the appointment of Mr. P. Ashley Cooper as Chairman of a re-constituted Board in 1925, recovery has been remarkable. As against a loss of £2656 in 1923, the year 1924 yielded a profit of £39,377, while between 1925 and 1929 profits rose from £56,385 to £246,721, and reserves of more than £1,000,000 were accumulated.

Under the present energetic management, the article goes on, the technique of gas manufacture has attained the standard set by the best British practice, the work of distribution has been greatly improved, progress has been made in the creation of an efficient staff, and financial control has been established in all departments. Although demand is still below European standards, it has rapidly grown in recent years, and the people of Buenos Aires increasingly appreciate the use of gas as an efficient and clean fuel, easily adaptable to many domestic and industrial purposes.

At the Buenos Aires Exhibition the Company are demonstrating in an attractive manner a selection of the latest types of gas appliances for cooking, heating, and industrial purposes.

The Rationalization Problem.

In the "Times" Annual Financial and Commercial Review, published on Feb. 10, economics and rationalization in so far as they affect the Gas Industry and the prospect of new legislation are dealt with.

In a year of exceptional difficulty, it is stated, the Gas Industry more than held its own. When the figures for the twelve months are available, it will be found that here and there some diminution occurred in the output of gas, but that elsewhere there was a normal and in some cases a large increase. It must not be forgotten, however, that during a century and a quarter of existence the Gas Industry has had to meet many crises, both internal and national, that it has constantly had to adapt itself to changing conditions, that it has been built up on a sound financial basis, and that it has highly developed central organizations dealing with every aspect of manufacture and supply.

The new legislation which will open fresh vistas to the Industry has not, unfortunately, materialized, but, it is stated, signs are not wanting that the Government is at last beginning to realize that the claims of gas undertakings for comprehensive amendment of the out-of-date laws under which they have to operate—claims which have the active support of the gas-workers' organizations—are well founded.

Another matter referred to in the article is the pressing need of the Industry for further facilities for rationalization. Not only must it be made possible for amalgamations and joint working arrangements between individual gas undertakings to be effected cheaply and simply, and on a more comprehensive basis than is permitted at present, but similar arrangements must be allowed between gas undertakings and allied industries. Industry has been urged to rationalize. Yet, when the Gas Industry asks for powers to rationalize itself without cost to the State, the appeal falls upon apparently deaf ears.

Reference is also made to the recent appearance on the Statute-book of the Coal Mines Act and the apprehension thereby caused in the minds of gas manufacturers.

Research and experiment, the writer says, proceed continuously, and the results are at once put into practice, so that greater economy and efficiency are constantly being obtained. There is a constant endeavour to reduce charges in order to increase sales, and in this way to lower overhead costs. With this end in view, the Industry is taking steps to develop large-scale gas supply for commercial and industrial uses.

"Forging Ahead."

Under this heading, the British Commercial Gas Association secured the back cover of the "Times" Financial and Commercial Review for a striking display in support of gas stock as a safe investment.

Some conclusive figures were given: "Nearly 10 million homes in the British Isles regularly use gas. Scores of thousands of up-to-date new houses are having gas laid on; 115,000 gas points were recently fitted in 20,000 new houses by one gas undertaking alone. 3000 trades use gas. Birmingham, Sheffield, and Coventry manufacturers alone require more than 7000 million c.ft. each year. Since 1912 the annual consumption of gas in the British Isles has increased from 210,000 million to 321,000 million c.ft. This increased demand for gas throughout the country has necessitated increases in capital of gas undertakings. One recent £2,500,000 4½ p.ct. debenture issue was over-subscribed 26 times."

"There can be no more striking testimony," it is remarked, "to the stability of an industry than the facts given above. For those who wish to place money with assurance of a secure return there is no more attractive investment than Gas Stock."

Municipal Tyranny.

The following is from a leading article of the "Journal of the Society of Chemical Industry" for Feb. 13:

It seems singular that one department of the Government should spend hundreds of thousands of pounds in assisting research in the fuel industry and in persuading the gas industry to experiment on new forms of carbonization, while local authorities, apparently with the approbation of the Minister of another department, refuse to

THE NEWS—*continued.*

allow the gas companies to lay down their pipes at their own expense. There may be considerations that are not obvious to those of us who are not closely acquainted with the friendly rivalry that has existed between gas and electricity during the last fifty years. Bearing this in mind, we hesitate to speak very confidently on the present state of our coal-mining industry and the urgent need for the more scientific treatment of our coal. In the past, one or two prominent men have urged the fuel experts to try and make fuel oils suitable for use in internal-combustion engines, and it would have seemed to us who are blessed with only ordinary judgment that the production of such oils would ultimately depend largely on the gas companies. We trust that means will be found in due course to encourage the authorities to increase the production of electricity, to increase the output of coal from our mines and the scientific carbonization of it by the gas companies, to encourage the transport of coal from the north of England to London, and to encourage the manufacturers of pipes to convey gas to everybody who desires to use it. Our industrial conditions are not so flourishing at the moment that any industry can afford to be handicapped unless a handicap is really essential to our well-being.

Political Interference.

At a dinner of the South Wales Branch of the Institution of Mechanical Engineers at Cardiff last Thursday, Mr. G. E. Hider, touching on the investigations held in relation to the most economical supply of power in Great Britain, said the investigations had not been so full as they might have been, and the whole body of engineers throughout the country would have been better satisfied had the gas industry entered more fully into the negotiations.

Engineers generally, he added, would not have failed to notice the stringent remarks recently passed by the very competent leaders of the gas industry in relation to this matter. The engineering industry as a whole looked forward to solving its own problems without political interference.

British Gas Light Company's Cricket Club Entertainment.

The Annual Whist Tournament and Dance organized by the British Gas Light Company's (Hull Station) Cricket Club was held on Friday, Feb. 6, a large number being present.

Mr. H. E. Copp, Engineer of the Hull Station and President of the Institution of Gas Engineers, welcomed the assembly on behalf of the Cricket Club, and thanked the Committee for the very efficient manner in which they had carried out the arrangements. Miss Mason, on behalf of the club, presented Mrs. Copp with a bouquet. Among others present were Mr. F. C. Robinson (Assistant Manager), Mr. and Mrs. W. Freeman; and many other firms in the city were represented.

Prizes for lucky ticket holders were drawn and presented by Mrs. Copp, who also performed this service for the first part of the whist tournament. Many "spot" prizes were also distributed throughout the evening.

Mr. J. Richardson, of the Hull City Supporters' Club, was presented with a case of pipes by Mrs. Copp as a token of esteem for the very valuable help he had given on this occasion and in the past.

This annual event is eagerly anticipated by a great number of people, and during the latter half of the week preceding the tournament all the tickets were sold.

Thirty-Eight Years' Progress.

The steadily-increasing demand for Aerograph spray-painting and finishing equipment both at home and abroad has made it necessary for the Aerograph Co., Ltd., of 43, Holborn Viaduct, E.C. 1, Inventors and Pioneers of spray-painting, to build a large new factory at Lower Sydenham, S.E. 26.

The new factory, which is designed on the most up-to-date lines, stands on a site more than two acres in extent immediately adjoining Lower Sydenham Station on the Southern Railway. Ample accommodation is provided for every department, and the factory is being equipped with the latest types of high-precision machinery for the manufacture of spray guns, air compressors, spray booths, and all the other many and varied items of equipment which constitute modern spray-painting and finishing plant. The new factory is very conveniently situated for the rapid despatch of goods by road or rail to all parts of the United Kingdom and also to the London Docks for handling the large export business of the Company.

In laying the corner stone of the new factory last year, Mr. C. L. Burdick, the Managing Director of the Aerograph Co., Ltd., recalled that Aerograph equipment was first placed on the market as far back as 1893. In those early days, manufacturing was carried on in a small workshop in Charles Street, Hatton Garden, and later in larger premises at Clerkenwell Green. In 1907 the present factory in Ironmonger Row, Old Street, E.C. 1, was acquired, but it is now quite inadequate to meet the demands of the Company's ever-expanding business—hence the decision to build the new factory at Lower Sydenham.

The Head Offices of the Company will remain at 43, Holborn Viaduct. The Aerograph Co., Ltd., will be established at their new factory early next month.

Gas and Dirty Ceilings.

Replying to a correspondent of the "Daily Telegraph" (over the *nom de plume* of "Estate Surveyor"), in which it was pointed out that surveyors were loth to adopt gas lighting on corporation housing estates on account of the fact that it quickly spoilt walls and ceilings, and thus increased the expenses on the houses for re-decoration, Mr. Walter T. Dunn, M.I.Mech.E., remarks that "Estate Surveyor" is not correct in stating that "gas lighting quickly spoils walls and ceilings."

The most modern gasfittings, states Mr. Dunn, are made with effective protective shields at the top which receive any dust which may ascend in the room during lighting time. If electricity is used this dust would deposit on the furniture. (This, we presume, the corporations do not object to as the furniture is the property of the tenants.)

One of the important advantages of gas, goes on Mr. Dunn, is that it requires air for its combustion, whereas the electric light is produced in a vacuum—airless.

It is interesting in this connection to note the remarks of Dr. Charles Carpenter on the subject at the recent Annual Meeting of the South Suburban Gas Company, at which he said that in regard to the assertion that it is more troublesome to keep ceilings clean with gas than when electricity is used, it is the dust in the air which is the origin of the so-called effects of gas. The late Dr. Richard Garnett put the matter very tersely when he pointed out the part played by the whitewashed ceiling. He said that it absorbed dust and dirt which would otherwise be absorbed by the lungs of the occupants of the room, and he added:

"You can whitewash the ceiling when you wish, but you cannot whitewash your lungs; and so it is better to have that dust on the ceiling than in your lungs where you cannot get at it."

Notes from Scotland.

The Official Opening of the reconstructed carbonizing plant at Johnstone Gas-Works is to take place on Feb. 24. In February, 1930, the Town Council decided to proceed with the scheme, and the contract was placed with Messrs. West's Gas Improvement Company, the cost being £11,670. The reconstructed plant has been erected on the same foundations and inside the same houses as the replaced vertical retorts which had been in use since 1913. Owing to the necessity for having sufficient workable gas-making plant available, the reconstruction work had to be undertaken in two stages; first, four old retorts were dismantled and two new retorts were erected and put to work; and, secondly, four old retorts were dismantled and four new retorts erected. The eight old retorts have thus been replaced by six new ones. The new retorts have a total daily capacity of 600,000 c.ft.

The European Gas Company, Ltd., have decided, subject to audit, to recommend a final dividend for the year 1930 at the rate of 3¼ p.ct., making 5¼ p.ct. for the year, free of income-tax. The final dividend for 1929 was at the rate of 3½ p.ct., making 5½ p.ct. for the year.

GLIMPSES INTO THE PAST - -

From the files of the "JOURNAL."

Gaslight from a New Source.

An eccentric philosopher at Bombay proposes the lighting of his city by gas manufactured from dead Hindoos. He says each body would yield 200 c.ft. of gas—stout ones would yield much more. Now, 8 rupees (16s.) per 1000 c.ft. would be a moderate charge; therefore, in a monetary point of view, it is calculated that the scheme would pay. Gas originally meant spirit—we suppose the light thus obtained might be called the shining spirits of deceased Hindoos. A similar suggestion has been seriously made in Australia, and an association has been formed at Sydney for promoting its adoption. [Jan. 12, 1864.]

British Association of Gas Managers.

The first general meeting of the members of this Association will be held at the Mechanics Hall, Manchester, on May 11. [May 3, 1864.]

Conviction of a Gas Manager.

At the Poulton Petty Sessions on the 17th ult., John —— was charged with having wilfully and maliciously damaged certain gas pipes belonging to Mr. W. Parkinson, proprietor of the Poulton Gas-Works. The evidence was that the defendant, who had been for two years manager of the gas-works, left the service of the plaintiff on Jan. 11, and that on that day the gas could not be lighted in the town, although the gasometer was full. On examination it was found that the syphon pipe was plugged up with tin, a quantity of water having previously been poured down it. The defendant was seen doing something at the spot, and no one else had access to the works after he left. The magistrates fined him in a penalty of 20s. and costs, in addition to the damage done, and in default of payment he was sent to prison for six weeks. [March 3, 1868.]

Clockwork Lighting Controllers.

In lighting and extinguishing lamps we have made some progress towards improvement. The lamplighter, although proverbial for his nimbleness, has not now to run from post to post with his ladder, to run up and down, to open and shut lanterns, and apply the flame to the burner. His ladder is superseded by a long stick torch, which is long enough to put through a hole at the bottom of the lantern, to turn the tap and light the gas, as it were, by one movement. It was lately tried to light the lamps by electricity, but this, at present, has been found to be an imperfect system.

The one I have been asked to explain to you to-night aims at three objects of improvement—to abolish the genus lamplighter, simultaneously to light and extinguish the lamps, and to economize gas. If it is capable of effecting only one of these, it is worthy of your attention, as beneficial to the gas companies, their shareholders, the ratepayers, and the public generally; and I shall recur with great satisfaction to the fact of my having been, in however indirect a way, the means of introducing it to the Society of Arts and the gas world.

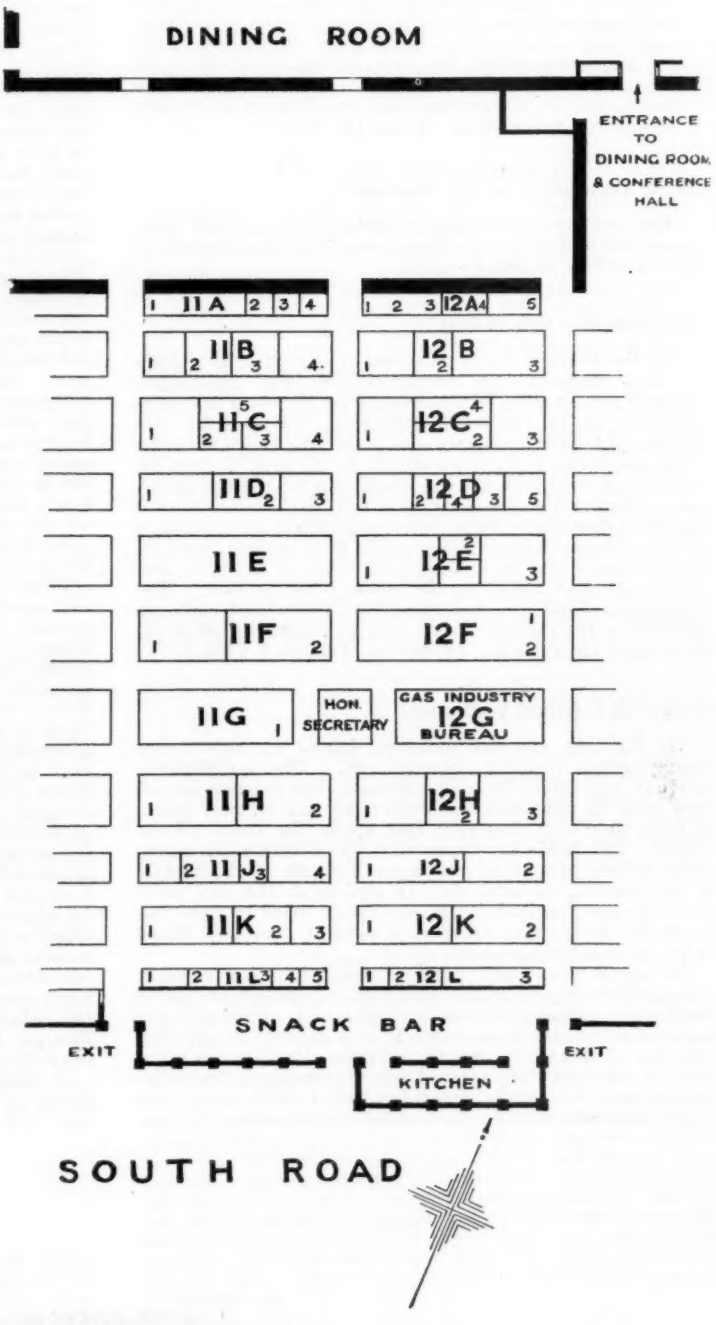
The letters patent (No. 2435) of Mr. Walter Thurgar (who, I may mention, is not professionally connected with gas engineering, but is a surgeon, at Norwich), sealed the 25th of February last, are for "Improvements in apparatus for regulating the supply of gas to burners." The basis of this invention is the American clock. The central spindle of an eight-day clock revolves once an hour, and has two arms inserted to gear with 48 teeth on an independent plate, which therefore makes its revolution in 24 hours. Of these 48 teeth, half are inserted on the upper and half on the under surface of the plate, and so have more liberty to bear upon the arms of the spindle. The independent plate has 96 cogs in its circumference, and its retrogression is thus prevented every quarter of an hour by a small spring stop, to avoid strain on the mainspring. In this 96-cogged plate is inserted a spindle, connected with the outer or dial plate, which has two arms—one fixed, one moveable. The moveable or adjusting arm is for regulating the hour at which the gas should be lit or put out, according to the time of year. The dial plate, of course, revolves also once in 24 hours, and at the proper time the arm presses one side of the double cam fixed to the tap in the vertical gas pipe. On one side of the tap, and connecting, as it were, the perforators, is a small groove to which I wish to direct your attention, for it is through this groove only, when the light is turned off, that sufficient gas escapes to supply the small blue flame, which continues—though invisible—during the day time. The cam being pressed, as I have stated, turns the tap and reduces the light to its blue flame, and on the other arm coming round, and in contact with the cam, it lowers the guard, turns on the gas at full, and in effect lights the lamp.

There can be no doubt as to the ingenuity of this machine, and most of those to whom it has been shown have expressed decided opinions as to its value and practical utility. The effect of the principle, if applied generally, would be very striking—the illumination, at the same moment, or practically so, of every public lamp, and that, too, at the very moment when artificial light is required, and the extinction of the light in the morning, which, however, would be gradual, and in relation to the gradual consummation of the light of day. When a lamplighter commences his beat he necessarily has to light a great many lamps long before they are wanted—as we frequently see them—and these are all burning at full cock to waste. By the same rule, a countless amount of gas is burnt to waste before it is put out in the morning. I cannot believe, therefore, that an apparatus which can be made to light and extinguish in a moment can fail to effect a great saving in the supply of gas, for the infinitesimal flame it burns during the day (and which has the advantage of preserving an equal temperature in the lantern) consumes no more than a cubic foot in twelve hours, the value of which we may reckon at a farthing. . . . Mr. Thurgar takes the bold but effectual step of attacking you scientific gentlemen of the gas world with your own weapons—of asking you to see and criticize his invention. [From a paper by Stephen Tucker to the Society of Arts—"JOURNAL" for June 9, 1868.]

BRITISH INDUSTRIES FAIR, 1931

GAS SECTION

ALDER & MACKAY, LTD.	11B–3
ASBESTOS CEMENT BUILDING PRODUCTS LTD.	11D–1
BRADDOCK J. & J.	11A–1
BRAY GEO., & CO., LTD.	12H–1
BRITISH GAS INDUSTRY, BUREAU	12G
BRITISH FURNACES, LTD.	11K–2
BRITISH ROAD TAR ASSOCIATION	12B–1
BROMFORD TUBE CO., LTD.	12K–1
CANNON IRON FOUNDRIES, LTD.	11F–1
CELLACTITE & BRITISH URALITE, LTD.	12C–2
COWAN, W. & B.	12F–1&2
C. C. FIRES, LTD.	12A–1,2&3
CORT, ROBERT & SON, LTD.	11B–2
DAVIS FURNACE CO., THE	11B–4
DEAN, W. H. & SON, LTD.	11D–2
DISTRICT IRON & STEEL CO., LTD., THE	11A–2
DONKIN, BRYAN & CO., LTD.	11L–5
ECONOMIC GAS BOILER CO., THE	11C–4
FLAVEL, SIDNEY & CO., LTD.	12E–1
FOSTER INSTRUMENT CO.	12L–2
FOSTER & PULLEN, LTD.	11D–3
GAS INDUSTRIES SECTION (HON. SECRETARY)	11G–2
GAS JOURNAL, LONDON	12L–1
GENERAL GAS APPLIANCES, LTD.	11F–2
GIBBONS (DUDLEY) LTD., & GIBBONS BROS. LTD.	11J–1
GLOVER, GEORGE & CO., LTD.	11C–2
GLOVER, THOMAS & CO., LTD.	11E
GRANT & WEST, LTD.	11A–3
HARPER, JOHN & CO., LTD.	11C–4
HICK, HARGREAVES & CO., LTD.	12A–4
HOLMES, W. C. & CO., LTD.	12C–3
HORSTMANN GEAR CO., LTD., THE	12H–2
"HURRY" WATER HEATER CO., THE	11K–3
INDUSTRIAL RESEARCH LABORATORY	12E–3
JOYMANCO (BRIGHTON), LTD.	12B–2
JUNKERS & CO. (GREAT BRITAIN), LTD.	11K–1
KENT, GEORGE, LTD.	11J–2
LIGHTING TRADES, LTD.	12H–3
MACPHERSON, DONALD & CO., LTD.	11C–5
MAIN, R. & A., LTD.	11E
MARSH, R. & COMPANY	11C–1
METROPOLITAN FUEL CO., LTD., THE	11J–4
MIDLAND BRASS FITTINGS CO.	12D–4
MILLARS MACHINERY CO., LTD.	11L–1
MOLER PRODUCTS, LTD.	12D–3
NATIONAL GAS ENGINE CO., LTD., THE	12J–1
NEW GEYSERS, LTD.	12D–1
PARKINSON STOVE CO., LTD., THE	12F–1&2
PARKINSON, W. & CO.	12F–1&2
P. B. SILLIMANITE CO., LTD., THE	11L–3
RADIATION, LTD.	11G–1
SAWER & PURVES	11A–1
SIGMA INSTRUMENT COMPANY	11L–4
STOURBRIDGE REFRACTORIES CO., LTD., THE	12D–5
STOVES, LTD.	11B–1
SUGG, WILLIAM & CO., LTD.	12C–1&4
SUTHERLAND, A. G., LTD.	12J–2
SUTHERLAND METER CO., LTD., THE	11H–2
TAUNTON, JOHN & JOSEPH, LTD.	12E–2
TENNANT, J. & SONS	12D–2
TIMMIS & CO., LTD.	11J–3
TUBES, LTD.	12K–2
TURNER, F. (ART METAL), LTD.	11C–3
WALKER, C. & W., LTD.	12A–5
WALLER, GEORGE, & SON, LTD.	11L–2
WATERLESS GASHOLDER CO., LTD.	12B–3
WELSBACH LIGHT COMPANY, LTD.	12H–3
WHITEHOUSE, WM., & CO., LTD.	12L–3
WILLEY & CO., LTD.	11H–2
WILSON, GEORGE, GAS METERS, LTD.	11H–1



PLAN OF THE STANDS

WITH NAMES AND POSITIONS OF EXHIBITORS

The full programme of the Joint Gas Conference, to be held on Tuesday, Wednesday, and Thursday, Feb. 24, 25, & 26, will be found on p. 263 of the "JOURNAL," Feb. 4

GAS INDUSTRIES SECTION

- - AT THE FAIR - -

"In the Gas Section . . . the industry has a really excellent opportunity for national advertisement on a large scale."—"JOURNAL," Feb. 4, p. 256

Feb. 16 to 27

[The exhibits are described in alphabetical order]

Alder & Mackay, Ltd.,

London and Edinburgh.

Messrs. Alder & Mackay, Ltd., are exhibiting several new products for the first time. These include their new "dual coin" prepayment meter interchangeable between 1d. and 1s. settings. The attachment of this meter resembles their standard disc change meter from the outside, having the same range plate and fixing, but the internal mechanism is, of course, quite different. It is, nevertheless, characteristically strong, and the alteration from 1d. to 1s. settings is simplicity itself, as is demonstrated on their stand. The firm's high-capacity "iron shell" meter is exhibited, and this, as the name implies, is of the cast-iron cased type—for installation in damp or otherwise adverse positions. The capacity per hour in relation to the case size has been greatly increased. The dry demonstration meter, also shown, is made in two sizes—for 100 and 200 c.ft. per hour. The dial of this meter is 9 in. in diameter, and the large pointer demonstrates the hourly rate of consumption by a minute's observation. It is ideal for cookery demonstrations and showroom work.

The firm's clock controller is shown in various types for upright burners, for overhead inverted burners in square lanterns, and constructed in an aluminium weatherproof box for suspension lamp supply. They are also showing tin-cased meters; a standard test holder, and a standard test meter to the latest B.O.T. Specifications, and various special gauges.

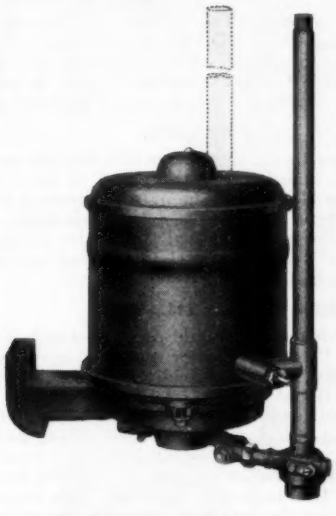
Arden Hill & Co.,

Aston, Birmingham.

(Radiation Ltd., Proprietors.)

A very fine example of modern advance in gas cooker design is shown in the Arden Hill "Acme New World" gas cooker in porcelain enamel finish, fitted with "Regulo" oven-heat control and with all the well-known features of the "New World" principle of oven design that have been so widely advertised during the last eight years.

Arden Hill's "Hotflow" Water Boiler.



Arden Hill's "B.T.U. Junior" Water Heater.

This firm also show their "Marchioness" gas fire with "Injector-ventilator" and fitted with the "Beam" radiants, one of their "St. Bernard" gas-heated radiators in old gold finish, and a "Sunhot" boiler (12-gallon size) in the standard finish. This firm's small hot water appliances are represented by a 2-gallon "Hot-Flow" boiler in mottled porcelain enamel exterior finish. Their exhibit is completed with a very good display of "B.T.U. Junior" boilers, one of which is shown loose for inspection.

Asbestos Cement Building Products, Ltd.,

Southwark Street, London, S.E.

This firm's exhibit is mainly comprised of their "Everite" asbestos cement flue pipes and fittings. A special display is being made of industrial fittings, including a large dust box and 4-ft. diameter pipes.

Special "Everite" ducts for acid fumes are also shown; and, in connection with domestic gas-fired apparatus, "Everite" geyser shelves, "Everite" slip sockets, "Everite" bentees, and gas cooker canopies. "Everite" flue pipes and fittings do not corrode and condensation is

eliminated. Very great advance in the finish of the firm's products will be noted, owing to the extensive modern pipe manufacturing plant which has been installed at their factories.

Birmingham Gas Department.—Industrial Gas Development Section.

The activities of the Industrial Gas Development Section of the City of Birmingham Gas Department are again represented at the Fair, with a view to calling the attention of manufacturers, both in Birmingham and outside, to the extensive use to which town gas is applied in general manufacturing processes.

The stand has been designed to fit in with the general arrangement and colour scheme of the Gas Industries Section, and the representatives in attendance will be able to give information to any interested visitor to the Gas Industries Section.

Close co-operation with the manufacturers of furnaces and industrial appliances has again been carried out by the Department in arranging the exhibits, and in view of the fact that a large amount of experimental work has been carried out recently by the Industrial Section on the question of thermostatic automatic control of gas furnaces and apparatus generally, a special feature of thermostatic and control apparatus as applied to furnaces, solution tanks, drying stoves, &c., has been made on the stand.

The exhibits on these stands are representative of the productions of the following furnace manufacturers:

Incandescent Heat Co., Ltd., Smethwick.

A " Super " natural draught gas-heated oven furnace is exhibited, with hearth space 3 ft. back to front by 2 ft. wide by 1 ft. high; built-in high quality refractory materials, with a lining between the refractory and the outside cast-iron casing of 12 in. special insulating material; and cast-iron door, lined with insulating concrete. Special attention has been paid to the design of the burners, the control of primary and secondary air supplies, and particularly damper control. This Company have recently developed an electrically-driven automatic control apparatus, which is attached to, and controls, the furnace at whatever temperature is demanded by the operator. This furnace is shown under practical working conditions, since provision has been made for heat-treatment work to be put through the furnace during the whole period of the Exhibition.

Lucas Furnaces, Ltd., Birmingham.

In addition to the exhibits which are shown on this Company's own stand in another part of the exhibition, the Birmingham Gas Department are showing an example of the latest type " Lucas " natural draught oven furnace with specially insulated wall, and also equipped with the " Electroflo " control panel, operating on the gas supply only, in this instance.

National Radiator Company, Ltd., Hull.

A special feature is made on this stand of a new design gas-heated " Ideal " boiler now being manufactured by this Company, the size selected being a No. 1.GB.3, which has a capacity of 45,000 B.Th.U. per hour. This boiler is working, and feeding six radiators placed both on this and the adjoining stand, with a view to calling particular attention to the simplicity, cleanliness, and ease of control of gas-heated systems as applied to central heating installations. The Gas Industry generally feels that it has a very strong case for the adoption of town gas in central heating systems, and the boiler designed by the National Radiator Company will undoubtedly assist in extending the already increasing demand for gas for this particular work.

Brayshaw Furnaces and Tools, Ltd., Manchester.

This well-known firm of gas furnace manufacturers are represented by one of their high-speed steel-hardening furnaces, which is used extensively, and has proved to be a very satisfactory furnace for the generation of the high temperatures required for the hardening of high-speed steel.

British Furnaces, Ltd., Chesterfield.

This firm are represented by a 300-lb. soft metal melting furnace operating on low-pressure gas. This furnace is an example of the range of gas-heated furnaces which this firm manufacture for the melting of lead, stereo, and soft metals generally. Messrs. British Furnaces have made a speciality of the melting of type metals, and their special equipment is installed in the majority of newspaper houses using gas as a fuel, which include some of the largest of the daily papers.

Carborundum Co., Ltd., Manchester.

A few of the special refractories manufactured by this firm are shown in certain standard sizes, with a view to calling the attention of manufacturers to the advisability of using high-quality refractory materials to reduce maintenance charges in furnaces in which ordinary temperatures are required, and also to show the value of special materials where high temperatures are required.

Cronite Foundry Co., Ltd., London.

The pans used in the carrying out of heat treatment operations in the gas-heated oven furnace already referred to are made of the " Cronite " material made by these well-known manufacturers of nickel-chrome alloy case-hardening boxes, pyrometer sheaths, &c. One or two examples of boxes and sheaths are shown.

Gibbons Bros., Ltd., Dudley.

This firm are represented by a gas-heated rotary carburizing furnace, demonstrating the practical utility of the rotating cylinder containing a certain quantity of carburizing compound, in which the work to be carburized is placed. Many manufacturers adopt this method of carburizing for certain classes of work in preference to the older method of pack hardening.

John F. Askam, Birmingham.

In the demand for automatic gas-heated furnaces, the rotary table furnace has shown itself to be an improved method for many heating operations, where previously the stationary type of forging furnace was used. The rotating table furnace shown on the Gas Department's stand, made by the above manufacturer, may be used for the heating of brass billets, for hot stamping rivets, and also for the special treatment of small automobile component parts, &c.

Other Apparatus.

In addition to the above exhibits in co-operation with the firms mentioned, the Birmingham Gas Department are showing a solution tank placed in a correctly designed brick setting, which has been found to provide the most economical method of town gas heating in connection with the heating of both small and large quantities of water and solutions, as used in plating shops generally. This tank is fitted with burners of the " Thermecon " type, having a disc flame formation made by Messrs. J. Rowell & Son, of Newcastle, with direct acting thermostat control, this latter piece of apparatus being manufactured by Messrs. Sperryn & Co., of Birmingham.

Several types of both natural draught and special gas and air blast burners are also shown, together with some examples of the smaller pieces of gas apparatus such as soldering stoves, &c. Further, the Industrial Gas Section have constructed, in collaboration with Messrs. Moler Products, a special gas furnace demonstrating the value of insulating material as applied to gas furnace design, and particularly showing the correct methods of introducing insulating material between refractory lining and the outside casing of the furnace.

On another section of this stand, demonstrations of different types of machines used for the testing of material are given, and a selection of apparatus used for the testing of fuels is also exhibited.

The apparatus generally includes the following:

Tensile Testing.—An Avery 10-ton single-lever type testing machine, fitted with universal testing gear, is shown under working conditions, and during the period of the Fair, tests on actual test bars are being carried out from time to time.

Hardness Testing.—For the testing of the hardness of materials, two pieces of apparatus are demonstrated, one of which is a Brinell machine, made by Messrs. W. & T. Avery, Ltd., operating on the dead weight principle, and another interesting machine which has recently been placed on the market by the same firm in the form of a direct-reading hardness tester, which has been specially designed for rapidly determining hardness of materials in terms of standard penetration numerals. These numerals are based on the depth of impression produced by a standard penetrator under action of a definite major load superimposed on the impression produced by a definite minor load, so that errors due to impressions of the surface of specimens are entirely eliminated. This machine incorporates a penetrator which may take the form of a steel ball or that of a diamond-shaped cone terminating in a spherical end according to the specimen required to be tested. The depth measuring gauge is an extremely accurate dial instrument, which gives direct readings in terms of two standard penetration scales, one scale applying to the ball penetrator and the other to the diamond cone penetrator.

Measuring Apparatus.—In connection with the measurement of gauges, jigs, tools, and similar articles, a selection of modern types of measuring apparatus and comparators are exhibited, and also a number of standard reference gauges and special measuring machines for measuring cylindrical objects are shown under working conditions.

Fuel Testing.—In connection with the testing of fuels, certain forms of calorimeters are shown, including a bomb

calorimeter of the latest design, and also a special fuel testing apparatus which has recently been placed on the market by Messrs. Stanley Belcher & Mason. In addition, the microscopic examination of metal specimens is demonstrated on this section of the stand.

J. & J. Braddock,

London and Oldham.

Messrs. J. & J. Braddock are showing on their stand a full size 12-in. station governor arranged for water loading or weights. The governor has sufficient seal to withstand pressures up to 20 in. of water, but can be arranged for still higher pressures; on the stand is also a patent retort house governor with a new type of valve so constructed that high vacuum conditions do not adversely affect the desired conditions in the foul main. They are also showing their new patent setting controller, which has been specially designed to control the pressure or vacuum conditions required in the common take-off pipe of a setting of retorts, to enable the maximum yield of therms and calorific value to be obtained, which may otherwise be affected by varying pressure or vacuum conditions. On their stand are exhibits of standard and high-capacity dry gas meters with their new two-coin attachment and with seamless diaphragms; also glass case meters to show the internal construction of the meters; a wet meter with improved drum of ordinary type; also their new patent double-drum wet meter, which will pass increased hourly quantities of gas with minimum loss of pressures. Another feature of this meter is that it allows a large amount of water to be evaporated for the 5 p.ct. range in registration.

There are also various forms of pressure gauges and high-class main cocks among their exhibits.

Geo. Bray & Co., Ltd.,

Leeds.

On this stand is a full range of Bray incandescent burners and mantles. The No. 790 D incandescent aluminium burner fitted with the Bray patented diffuser is prominently shown, accompanied by other patterns of the No. 790 series. These burners are fitted with a device which prevents lighting back and renders the burners practically noiseless in use. They continue to give good service, and are greatly appreciated by gas engineers. They have been adopted as "maintenance burners" by many gas undertakings. They are also exhibited in chromium-plated finish.

Bray Universal Burner fitted with Metal Diffuser.

Three-Light Medium Cluster Burner for Shop Lighting.

A wide range of incandescent burners is on view—inverted types, including one with a reversible arm for adapting to either upright or inverted fitting; swan neck types; upright burners, for which there is still a considerable demand; and burners for bowl lighting, hall lamps, landings, &c. All Bray burners are made of the best materials, designed to maintain the highest efficiency, and tested under actual working conditions before leaving the factory. To interest street lighting engineers a selection of well-made street lighting burners is on view. Although the well-known Bray flat-flame burners are little used for lighting purposes, manufacturers of gas heating apparatus will be interested in the flat-flame burners this firm make for this purpose.

British Gas Industry—Information Bureau.

The British Commercial Gas Association and members of the Heavy Section of the Society of British Gas Industries have erected a striking exhibit (designed by Mr. H. Austen Hall, F.R.I.B.A., the Association's Consulting Architect) to serve as an Inquiry and Information Bureau at which visitors to the Fair can obtain the latest and fullest information with regard to gas equipment, modern practice, and public service.

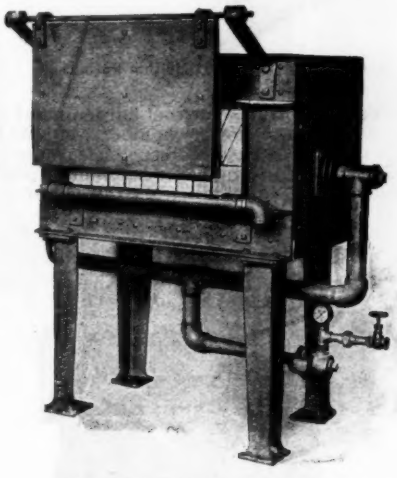
Important features of the external part of the exhibit are a series of twelve illuminated oil paintings illustrating and describing the activities of the Gas Industry in the development of the trade of the country and in the life of the people, and charts and statistics showing the national importance and growth of the Industry. Internally the modern application of gas for heating and lighting is featured in the Rotunda and the four interviewing rooms. A comprehensive display illustrating and demonstrating the work of the "B.C.G.A." is arranged inside the exhibit, and is available for the inspection of visitors.

The exhibit will be staffed by a team of first-class gas salesmen and saleswomen throughout the period of the Fair.

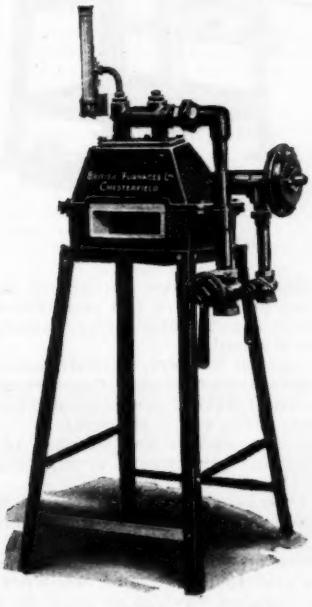
British Furnaces, Ltd.,

Chesterfield.

A gas-fired rivet heater of the portable type is shown, and this heater is of the form as used in shipyards, constructional works, railway workshops, &c. The main features are rapid heating, uniform temperature, control of atmosphere in the furnace, single valve control, and automatic proportioning of the gas and air, all of which are obtained by the use of the well-known "surface combustion" equipment supplied by British Furnaces, Ltd.



Gas-Fired Rod End Forge Furnace.



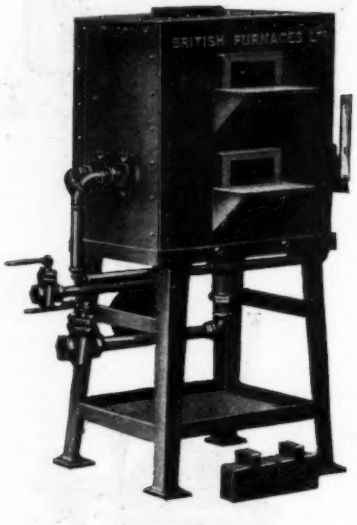
Gas-Fired Portable Rivet Heater.

Another exhibit of interest to firms melting tin, lead, type metal, and other soft metals is a small gas-fired melting furnace fitted with natural draught burners and having a pot capacity of 300 lbs. of lead. A considerable number of these furnaces have been supplied for a variety of trades,

and show remarkably high efficiencies for this class of furnace.

Gas-Fired Soft Metal Melting Furnace.

A high-speed steel furnace for tool hardening at temperatures up to 1350° C. in the lower chamber and 875° C. in the upper one, is shown. A gas-fired crucible furnace for brass and copper melting and suitable for accommodating a 40 lb. (copper) crucible is also exhibited on this stand.



High-Speed Steel Furnace.

A further exhibit of interest to the nut and bolt trade and also to rivet makers is a rod end heater, fitted with surface combustion automatic proportioning and single valve control equipment.

Various gas and oil burners, venturi mixers, and other gas burning appliances are shown, together with a number of photographs and coloured drawings of large furnaces for normalizing, annealing, and carburizing.

The Company are makers and builders of furnaces for practically every industry where heat is required in the manufacturing processes.

The wide and varied experience which the firm have had in the building of special furnaces for all classes of work puts them in an exceptionally good position to undertake consultation work on heating problems in connection with new processes, and to design and construct on scientific lines whatever furnace equipment may be necessary for their commercial development.

British Road Tar Association,

17, Grosvenor Gardens, London, S.W.

This stand is designed in a manner that permits visitors to familiarize themselves immediately with the merits of tar for the construction and maintenance of roads, as the base of the stand is composed of various types of tarred materials. Here are examples of durable and safe tar roads, which constitute the greater mileage of our highways throughout the country. British tar to specification has all the characteristics essential for the construction of road surfaces capable of withstanding modern traffic conditions, and is easy to apply and economical to maintain. Throughout the country, tarred surfaces are becoming increasingly recognized as being by far the safest for all classes of traffic. In addition, the non-skid properties conferred by the use of tar on existing smooth road surfaces are now universally admitted.

Bromford Tube Company, Ltd.,

Aston, Birmingham.

The Bromford Tube Company, Ltd., are exhibiting weldless steel tubes from ¾ in. to 15 in. bore, and many exhibits are of particular interest to the gas industry, the chief of which include gas mains and lighting standards.

Bromford seamless steel tubes and fittings provide a very complete and efficient system for gas distribution, and are used for service mains, gas manufacturing, and bye-products plant in all parts of the country. Complete installations, including bends, tees, syphons, and all fittings, can be supplied with spigot and faucet or special joints—the whole system being protected thoroughly with a coating of special preservative solution and a wrapping of close textured hessian impregnated with the same preservative. Tubes can be supplied in lengths up to 45 ft., or longer if required, which reduces the number of joints to an absolute minimum.

With the Bromford special quality seamless steel main bending on site can be done easily, thus avoiding a large number of fittings (each with two joints) and enabling mains to be laid more speedily and at lower cost.

Bromford seamless steel lighting standards have many advantages, and are being adopted in increasingly large numbers by municipal authorities in all parts of the country.

Distinctive types are manufactured for every gas and electric lighting requirement, and specially designed plant enables them to undertake large scale production at competitive prices. The spiral and vertical fluted columns which are being exhibited are very pleasing in appearance, but plain columns can also be supplied for any type.

Other exhibits include loose flanged tubing, including Carlton joints for collieries, boiler tubes, steam pipes, superheater tubes and coils, tram and transmission poles, ships' derricks, and davits.

C.C. Fires, Ltd.,

London.

This firm are exhibiting a new gas and coke fire, the coke fire taking the form of a simple stool grate which is adaptable to any shape of fire opening, and which is also interchangeable with the grate for coal supplied with C.C. fires. This stool is giving good results, and is in operation on the stand, where identical fireplaces and flues are burning respectively coke, gas, and coal.

All C.C. fires having igniting burners can now be fitted with a special twin tap on the fire for the igniting burner and gas fire control, the supply being taken to the fire by a single pipe in the usual manner.

The evolution of the patent adjustable stool grate makes the C.C. fire easily adaptable to almost every type and every size of fireplace without structural alterations. Briefly, the apparatus consists of a low, barless grate, incorporating at the front, low on the hearth, an efficient gas fire of large heating capcity. The radiants lie back at a slight angle, throwing the heat well out into the room, and ejecting the combustion products into the chimney—providing efficient ventilation at all times. The gas fire is enclosed by a protecting cover when the open fire is in use. The gas fire body is hinged at the top and may be swung up and held suspended by a catch, or alternatively may be withdrawn bodily, for the removal of ashes from underneath the grate. Either operation is very easy, a matter of seconds only, and does not affect the gas supply. Carried at the back of the gas fire (if required) is a separate gas burner for igniting the open fire by gas, thus avoiding the use of wood and paper and removing the objection to laying fires. Fresh fuel may be thrown on top of the cinders and thus every piece of fuel is used and the labour of clearing the grate reduced to a minimum.

Cannon Iron Foundries, Ltd.,

Deepfields, near Bilston.

The new inclined gas fire exhibited by this firm has a unique principle of construction which enables the sloping radiants to be set at the correct angle for uniformly heating the room with minimum gas consumption, and the exacting demands of modern hygiene are fully met by the

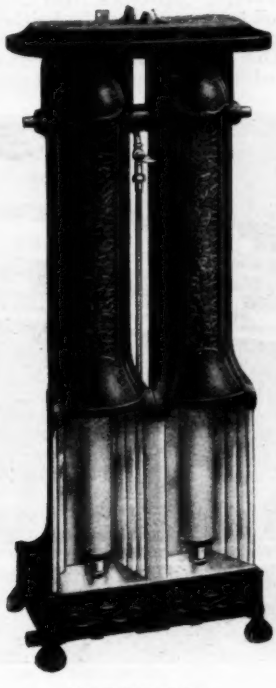
effective ventilation which the design ensures. In addition to the best satin finish, a great demand is made for the art copper bronze and art silver finishes, and the varied tastes of the discriminating are provided for in the art metal sheathed finishes in antique copper, antique brass, and antique pewter. The " Vitaglo " radiant is now supplied with Cannon fires. These radiants are much brighter. The medical world is agreed that this type of radiant heat is more healthy than the dark rays of longer wave length.

a hotplate of an entirely new design, having burners drilled with radiant holes in four sections, and combining the merits of both drilled ring and efficiency burners—*i.e.*, high efficiency and perfect combustion. The bars are designed so as to give increased pan stability. The oven, with a specially constructed bottom flue, ensures a high efficiency, prevents short circuiting, gives a very even heat, and eliminates condensation.

The " Belle " radiator for halls, corridors, shops, &c., is

"New Challenge" Cooker, in Porceliron Mottled Enamel Finish.

New Inclined Fire.



"Belle" Radiator.

The " New-Challenge " gas cookers shown are thoroughly up-to-date and embody all the modern points of practical construction. In the " Porceliron " mottled enamel finish these cookers present a beautiful appearance, and the smooth clean surface of the enamel is hard, durable, and very easy to clean. The " Autimo " oven heat controller is perfectly reliable and takes charge of the food, giving relief to the busy housewife who can use to advantage the time thus saved. Exhibited for the first time are " Double Centenary " gas ranges in " Porceliron " mottled enamel finish with white-tile pattern enamelled exterior, sides, and door panels. The ovens and hotplates are on one level. The ovens are double cased and enamelled throughout.

Another new model, the " Cambridge " gas cooker, has demonstrated. Artistic in appearance, well constructed, and conveniently installed in any position, this radiator is well known throughout the country. There is no fear of condensation, the necessity of a water pan is obviated, and the radiator is odourless.

Cellactite and British Uralite, Ltd.,

Lincoln House, High Holborn, London, W.C.

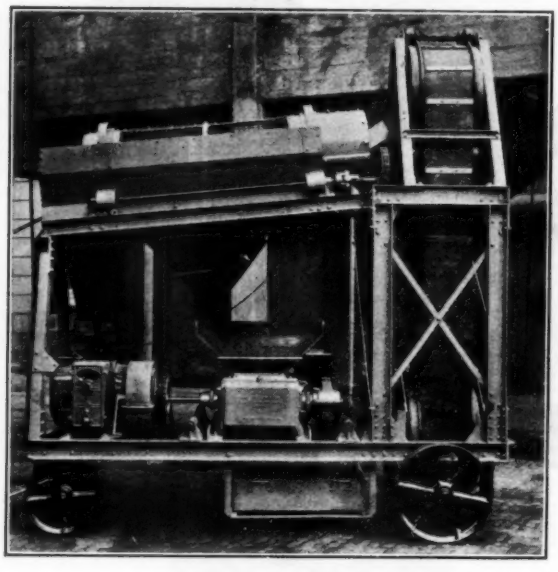
This year the " Urastone " exhibit includes new features. Various fittings to overcome draught and other troubles are shown, these being made up in the firm's incorrodible material that over so many years has proved its claims to permanence and sightliness. " Cellactite " steel-cored incorrodible corrugated roofing—another of the firm's pro-

ducts—is now available in gauge cores stouter than previously, meaning wider purlin distances and a consequent saving in structural cost to the purchaser. Fire-proof "Uralite" is also shown. "Asbestone" (asbestos-cement) in the form of cooker bases, fire surrounds, hearths, and roofing is also exhibited.

Robt. Cort & Son, Ltd.,

Reading Bridge Ironworks, Reading.

This firm are exhibiting actual examples of the latest type of their patent coke cutting machines, which, owing to their efficiency in the "sizing" of coke have become popular among gas and coke oven engineers. We were informed that eleven standard sizes of these machines are made covering capacities from 2-75 tons per hour in both 2 or 4 roll types, and they had either been supplied or specified in connection with most modern plants under construction. One of the latest developments of this firm is an improved type of complete portable coke grading plant



Portable Coke Grading Plant.

(patent applied for) as shown in the accompanying illustration. The set comprises the power unit, a coke cutting machine, reciprocating type screen to take out the "fines," delivering the over-size into an I.R. band and bucket elevator which discharges into a rotary type screen, under which are bagging chutes. It is claimed that the arrangement will fulfil a real want in a number of works, particularly where it would be an advantage to take the plant to the storage heaps rather than to incur expensive transport to a fixed plant. The whole combination is very compact and distinctly portable, and the grading obtained very efficient. Other specialities shown include a model of Cort's patent anti-dip valve, which has been installed in approximately 200 works; the "Hulme-Hornby" grinding mill for analytical purposes; main drilling and tapping apparatus; and pipe cutters of robust type.

W. & B. Cowan,

Victory Works, Stretford, Manchester.

Messrs. W. & B. Cowan are showing on their stand certain new products for the examination of gas engineers. The exhibits include a new patent valveless bell station meter which is claimed to be capable of passing and registering correctly double the volume of gas passed by the usual type of drum station meter, with a loss of only 5/10ths pressure. The travel of the registering bells is the same at each stroke, so that a known quantity of gas is displaced at each revolution, ensuring accurate registration. The mechanical parts are few, and the chance of failure is correspondingly small.

Another exhibit of unusual interest is the consumers' oil positive displacement meter. This meter combines all the advantages of the reliable registration of a wet meter with long life, and the advantages of the dry meter, due to the fact that it does not require any attention after being fixed. In tests at the works, this meter has registered at par, at varying loads from zero to 250 c.ft. per hour, within a loss of 5/10ths pressure.

Messrs. Cowan are also exhibiting a variety of other gas apparatus, including the Duplex wet meter, "Ferro" iron-cased dry meters, water meters, retort house and station governors, &c.

Davis Furnace Company,

Diamond Foundry, Luton.

The Davis Furnace Company are exhibiting two of their well-known "Revergen" furnaces. A furnace of the oven type, having working chamber 4 ft. 7 in. long by 2 ft. 2 in. wide by 1 ft. 5 in. high, is exhibited on the stand. This embodies all the latest improvements which experience of the use of highly efficient insulating materials has made possible. The structure is of extremely rigid design, comprising a series of vertical buckstays, tied laterally and longitudinally by heavy section steel plates, tie bars, cast-iron thrust plates, &c. At the front end of the furnace a geared rise and fall counterbalanced door, of heavy section, is provided. The operation of the door is adjacent to the control quadrant, on the left hand side of the furnace, so that the reversing lever, the gas and air control quadrant with vernier indicator and gear operation are all situated in close proximity. The reversing gear, while being operated from the front of the furnace, is neatly housed at the back of the furnace; the whole is extremely compact in design.

This furnace is fitted with an electrically operated automatic reversing gear, especially designed to meet the requirements, by Messrs. Venner Time Switches, Ltd., in collaboration with the Davis Furnace Company, and with an electrically operated automatic temperature control designed by Messrs. Electroflo Meters, Ltd. The whole furnace represents the application of gas to general industrial operations in its most up-to-date form.

An interesting development in the semi-automatic forging type furnace is also shown on this stand. This furnace, which has a heating chamber 6 ft. long by 1 ft. 6 in. wide by 10 in. high, has been developed as the result of very extensive investigations and tests carried out at the Company's Works at Luton with a view to raising the efficiency of the open-fronted type of forging furnace.

The regenerators in this case are situated above, not below, the working chamber. The flames are projected in a downward direction, first on one side and then on the other side of the furnace chamber, crossing the floor and passing out through the ports on the opposite side to which the flames are entering.

The flames are transferred from side to side of the furnace periodically in accordance with the well-known reversing principle. By making use of draught-inducing contrivances the products of combustion can be prevented from escaping through the openings at the back and front of the furnace, thus ensuring the full utilization of the "Revergen" principle, with its resulting saving in gas.

On the stand are also shown two examples of the Davis burners which are now so widely used on fish-frying ranges. Most of the leading range makers have adopted this system of range firing by gas. The unique feature of this burner is that it uses only one tap for four separate positions, *i.e.*, "off," "full on," "low," and "all off." In addition to proved efficiency the burners present a handsome and pleasing appearance.

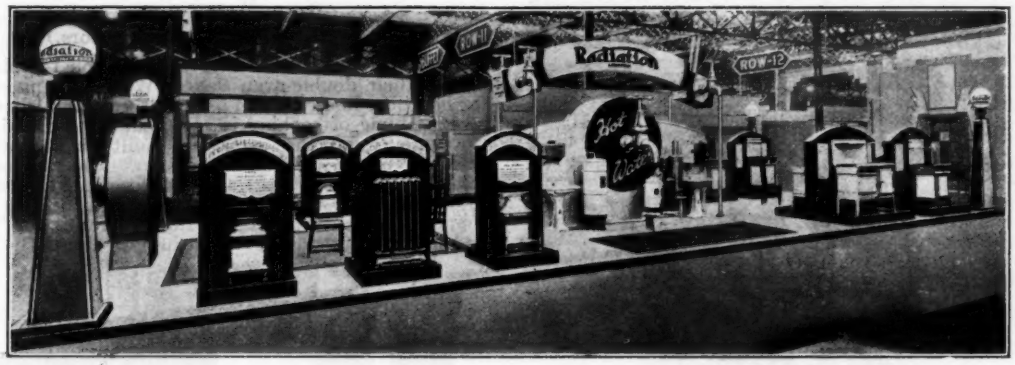
Davis Gas Stove Company, Ltd.,

London and Luton.

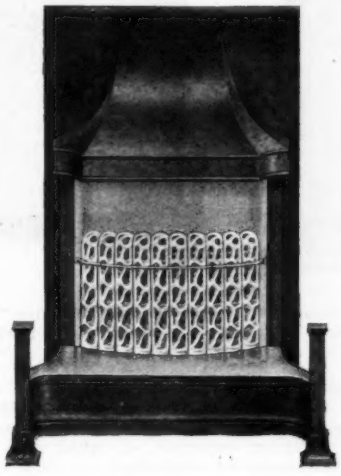
(Radiation Ltd., Proprietors.)

In addition to a fine example of the "Alpine New World" cooker shown in porcelain enamel finish (one of the smaller sizes), there is an interesting "New World"

The Davis "Alpine New World" Hot-Top Range.



cooking range in porcelain enamel, with many improvements, both in labour-saving and efficiency. It has its own independently heated burner, with the " Hot-Top," making this range a good example of modern kitchen equipment.



The Davis "Antony" Gas Fire, with "Beam" (Trade Mark) Radiants.

The range of Davis fires is very ably represented by the " Cleopatra " model, shown in attractive armoured copper. As a contribution to the range of modern gas-heated radiators, this firm's " Balance " design will call for considerable

The Davis "Shamrock" Geyser.

attention. The safety principle of this radiator has ensured a very wide popularity throughout the country. The Davis exhibit is completed with three very striking examples of their " Shamrock " geysers, finished in oxidized bronze, art white, and black and silver. Attention is specially drawn to the art white finish, which is very beautiful and well carried out.

W. H. Dean & Son, Ltd.,

Victoria Works, Burnley.

A number of this firm's boilers are exhibited, fitted with brass draw-off tap for emptying purpose. On this stand there is a large variety of these appliances on view, including patterns having the outer casing made from strong steel sheet and porcelain enamelled black and white mottled finish, these being very durable. They can be wiped down with a damp cloth after use, to maintain their appearance.

Some of this firm's boilers also are supplied with a wood cover, which after use can be reversed to form a small table, this being very serviceable in kitchens where space is limited. Also copper water heaters and counter urns for restaurants, workshops, &c., and rustless cast-iron pan boilers specially recommended for butcher's use in brawn making, ham boiling, &c., are exhibited, together with gas-heated washing machines, complete with agitator and the 16-in. size " Acme " wringer. Other exhibits include stove piping, corrugated elbows, ventilating caps, tee-pieces, and patent bafflers, &c., for use in connection with the above.

District Iron and Steel Company, Ltd.,

Smethwick.

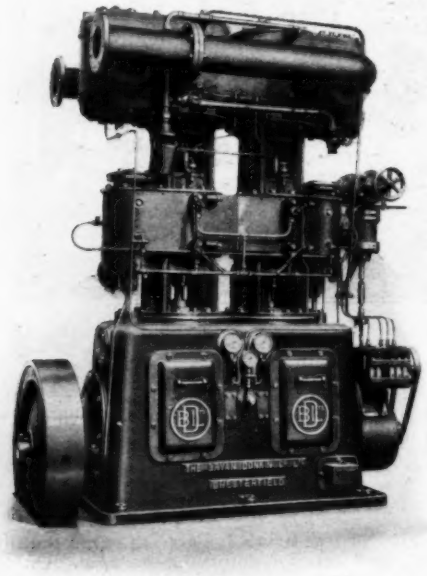
This firm are exhibiting a working model of the Broughton-Hadlington patent automatic gas producer feed. Fuel is automatically fed into a hopper, preferably from an overhead bunker, and so through two apertures in the top feed plate, and corresponding ones in the emergency valve. As the pockets in the lower rotating valve coincide with the apertures in the plates or valves above, they fill with fuel, and on coinciding with the apertures in the lower fixed water-cooled valve or plate, the fuel is discharged on to the distributor, rotating at 160 r.p.m. There are no mechanical pokers or levellers, the rotating distributor being so designed as effectively to scatter the fuel evenly over the fire bed. Should a large lump of coal or any foreign substance get into the fuel supply and be unable to pass through the valves, the emergency valve (normally stationary) is brought into action by an automatic device which attracts the notice of the attendant, and the substance fouling the mechanism can be removed. In case of need, the shutting-off valve below the rotating valve can be turned so as completely to close the top of the producer.

Bryan Donkin Company, Ltd.,

Chesterfield.

Among the numerous photographs shown by this Company are many examples of Rateau turbo-exhausting plants. The Company hold the licence for the manufacture of turbo-exhausters, compressors, boosters, and blowers, and have now supplied over 290 to gas-works, coke oven installations, &c. For the last 75 years the Company have been making exhausters which are now used in all parts of the world, in gas-works and for many industrial purposes; the total number being upwards of 7000. Models are exhibited on the stand of the two-blade and three-blade type exhausters. Another specialty of the Company is gas valves, which they have been making over eighty years. Last year the sales reached a total of over ten thousand valves. Models are exhibited of high and medium pressure double-

faced valves, the single-faced rack and pinion valve, and worm and rack valve, and also a disc valve for use with purifiers.



Bryan Donkin Vertical Steam-Driven Reciprocating Compressor, with a capacity of 25,000 c.ft. per hour against 5 lbs. pressure with 80 lbs. steam pressure, and running at 400 r.p.m.

A photograph is shown of a 48 in. diaphragm gas governor at the Nechells Works of the City of Birmingham Gas Department. This is the largest of its kind in use in this country. There is also a photograph of an installation of special Reynolds high-pressure district governors at Kings Norton which are reducing the gas pressure from 15 lbs. per sq. in. to the normal supply pressure. Photographs are shown also of other types of gas governors and regulators for district and service work.

The Company are among the pioneers of the high-pressure system of gas distribution in this country. Their specialties also include rotary and reciprocating gas compressors, pressure blowers for industrial purposes, and oil spraying plants to prevent naphthalene troubles. They are exhibiting various types of gas pressure regulators for gas services, meters, stoves, geysers, radiators, &c., an improved type of lubricator for gas exhausters and gas and air blowers, and an oil-sprayer for the removal of naphthalene deposits in gas mains.

This Company are now developing in this country a high-speed turbo-exhauster designed on the Rateau principle for speeds up to 10,000 r.p.m.

Economic Gas Boiler Company, Ltd.,

Burnley.

The Economic Gas Boiler Company, Ltd., display a full range of their specialities, including packed boilers, single-case boilers, enamel and vitreous enamelled boilers, also designs with combined steam and fume outlet, full-open tops, fixed or loose copper or wooden lids—in fact, everything that applies to gas-heated wash-boilers.

Attention is directed to the firm's No. 12 boiler with protector plate, rustless cast aluminium top rim and grey mottled enamelled casing, which can be washed down with the same ease as crockery.

The growing demand by gas companies for boilers suitable to put on rental at a very small weekly cost is met by a special line now generally known as the " rental " boiler; sound construction and economical gas consumption characterize this model.

Sidney Flavel & Co., Ltd.,

Leamington.

The items of special interest on this stand are the Flavel gas cooker in many sizes and finishes, and a new type of smokeless open fire, which burns ordinary gas coke with excellent results. A type of gas fire is also shown, being in the form of imitation wood logs which, when the gas is lighted, present exactly the same appearance as the ordinary wood fire.

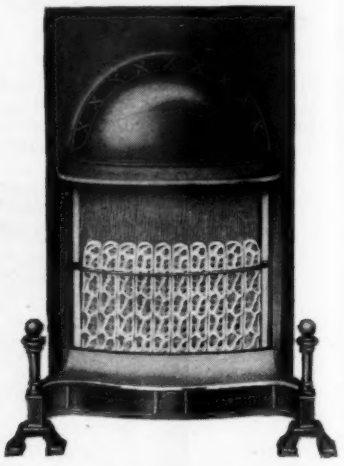
Fletcher Russell & Co., Ltd.,

Warrington.

(Radiation Ltd., Proprietors.)

The most notable Fletcher contribution to this stand is one of their double-oven " New World " ranges, suitable for boarding houses, hotel use, canteens, and where a fairly large volume of cooking is required. It is fitted with the " Regulo," and the ovens are built on the well-known " New World " principle of design. The meticulous care taken at Palatine Works with gas fire finishes is admirably shown in their " Hamilton " fire, finished in oxidized copper. This fire has the " Injector-ventilator " feature, and incorporates the new " Beam " radiants.

The Fletcher " Embassy " Radiator.



The Fletcher " Hamilton " Gas Fire, with " Beam " (Trade Mark) Radiants.

Examples of the three-column " Embassy " radiator and a horizontal sink water heater in nickel-plated finish, together with a circulating boiler on stand, in mottled finish, make up a striking example of what this progressive Warrington firm have accomplished.

Foster & Pullen, Ltd.,

Avil Works, Crossley Hall, Bradford.

This firm are showing a new range of inverted lamps, including a midget 3-light selling at a low figure; square lanterns with cut-glass refractors which bend waste light into useful directions; new designs in wrought-iron brackets; public lighting appliances of all kinds, from their big strip lantern with 16 mantles in a row to a miniature model of lantern and pillar.

Specially featured are strip lanterns for shop fronts, with switches to control from inside the premises.

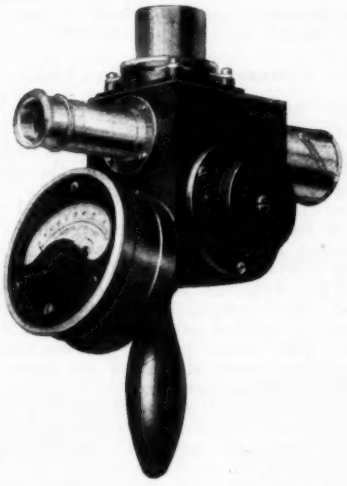
Foster Instrument Company,

Letchworth, Herts.

The manufacture of gas is, in every case, a process depending on accurate temperature control, and, similarly the efficient industrial use of gas demands exact knowledge of temperature; therefore no apology is needed when drawing the attention of our readers to an exhibit demonstrating a wide range of pyrometers of all types, including those adapted to the automatic control of temperature.

Space does not allow a detailed description of all the instruments which the Foster Instrument Company show in actual use, but their optical pyrometers are worthy of special notice. The ability to explore, rapidly and accurately, the temperature distribution in retorts and settings is of obvious value. The optical pyrometer with the " Lamp-bridge Unit " is distinguished by several technical points of practical importance to the user, an instrument of this type is illustrated here. It comprises an easily focussed telescope, and, inside the telescope, directly in the line of vision, a small electric lamp so placed that its filament is seen superposed on the image of the hot surface just as if it were in contact with it. A small portable accumulator is contained in the carrying case that the user wears slung on his shoulder, and the current through the lamp is varied by the circular knob controlling the rheostat until it is of exactly the same brightness as the furnace

and " disappears " against it. The temperature is then read directly on the scale of the small indicator mounted on the instrument.



Foster Optical Pyrometer with Patent " Lamp-Bridge Unit."

The " matching " is done in a few seconds, but there is thereafter no need to hurry in taking the reading. It will remain steady until changed by the rheostat; thus, when working in dark situations, it is very easy to move to the light to take a reading. With the advent of the " Lamp-bridge Unit " invention the lamp filament forms one arm of a Wheatstone Bridge, so that, the bridge being balanced at the bottom of the scale, the whole scale is usefully employed. Thus a small and light indicator is mounted on the pyrometer and allows very accurate readings. It should be noted that the accuracy of measurement does not depend on colour estimation by the user. He may even be colour-blind. All he has to do is to note when the filament " disappears," and even an unskilled user can make very accurate readings.

" Gas Journal,"

11, Bolt Court, Fleet Street, London, E.C. 4.

No one will deny that a stand by the entrance to the Snack Bar has a certain advantage, and Walter King, Ltd., have made the most of a cross-road site in the disposal of their tiny plot. Parts of the two free sides of the stand have been converted into a lectern of convenient height for passers-by; so that without difficulty " who runs may read." Last year the brilliant cover and modern lay-out of the young independent " Salesman " caused something of a sensation in the Gas Section, and many members even of the general public stopped to turn its pages. Now the first year's bound volume is on view, and all who see it will agree that it makes a most attractive and useful book.

But the great " show line " this year is the " Gas Journal " Calendar and Directory, 1931, whose reception in the Gas and Allied Industries has astonished even the publishers. A few extracts from the hundreds of personal appreciations sent to Bolt Court may be seen framed on the wall of the stand; and copies of the book itself are open for inspection.

Walter King, Ltd., during 1930 made two other notable additions to gas literature—" Assessment of Gas Undertakings," by H. T. Seymour, A.C.I.S., A.L.A.A., and " Electricity on Gas Works," by H. C. Widlake, Assoc.M.Inst. Gas E.; and these authoritative works are certain to attract attention.

Finally, on their stand at West Bromwich, as in all their work, Walter King, Ltd., have " Service " as their motto; and they hope that in 1931, no less than in former years, visitors to the Gas Section will " ask them on Stand 12 L-1." Mr. Blencowe, who is in charge, came to Walter King some thirty years ago; and in that space of time many facts and figures accumulate in a Publishers' office.

General Gas Appliances, Ltd.,

Guide Bridge.

Shown for the first time at the Fair is the thermal storage " Immersion " indirect water heater. This is a self-contained indirect water heater, a development of and embodying the principle of the now popular " Immersion " indirect water heater. The latter unit can be fitted to any existing household hot water system with the minimum amount of work.

The " Governor-General " gas cooker is offered in seven models, and can be supplied with either tiled or the popular " willow " pattern exterior enamels. A new series of this cooker is shown with cast-iron sides. The " Governor-General " gas cooker, with its automatic oven control, neat porcelain enamelled finish, and " willow " pattern exterior enamels, is a definite step towards brighter and more efficient kitchens. The gas fire exhibit includes selections from the " High Peak " series in various art metal finishes. Special attention is called to the new curved " Gen-Ray " super radiants which are supplied as an alternative to the standard upright type on " High Tor " and " Wrekin " fires. All fires are fitted with the latest in burner construction and adjustment. Gas-fired steam and " non-steam " radiators may be inspected. Both types of radiator are ideal for works, schools, churches, shops, &c.

Gibbons (Dudley), Ltd., and Gibbons Brothers, Ltd.,

Dibdale Works, Dudley.

These firms have an office and reception room on their stand, where representative samples of refractories manufactured by Gibbons (Dudley), Ltd., may be inspected. These include sillimanite, carborundum, corundum, silica and highly aluminous bricks, blocks, and special shapes. The office is constructed with standard No. 1 grade firebricks manufactured by Gibbons (Dudley), Ltd., the windows being formed of silica segmental retort sections and silica combustion chamber blocks. Messrs. Gibbons Brothers exhibit photographs and drawings of recent installations of horizontal and vertical retort settings, also of the Gibbons-Kogag coke ovens, a large installation of which is now being erected in the north of England.

Messrs. Gibbons Brothers make it their business to assist their friends in the Gas Industry in the sale of gas and coke. They have a large department designing and constructing furnaces and tunnel kilns which consume these fuels. Photographs and drawings of tunnel kilns, carburizing and heat treatment furnaces can be inspected at this stand.

It is interesting to note in this connection that the Dress-

ler tunnel kilns erected in the past twelve months consume 7000 tons of coke annually, and the gas consumed by kilns and furnaces erected in the same period amounts to 95 million c.ft. annually.

George Glover & Co., Ltd.,

Ranelagh Works, Chelsea, London, S.W.

"One slot takes the lot"—this familiar slogan is much in evidence on the stand of Messrs. George Glover & Co., Ltd., of Chelsea, who have again made their "Chelsea Three" coin prepayment gas meter the central feature of attraction.

It is now over a year since this three-coin meter was first introduced. In our issue of Jan. 29, 1930, we pointed out that this was "no ordinary meter" and that it would "prove a boon to gas undertakings and their consumers." This is exactly what has happened, and the "Chelsea Three" has made steady progress in all parts of the country. The marked convenience to the consumer of being able to insert, into the one coin-slot, a shilling, a sixpence, or a penny (whichever is most handy), without altering or adjusting the mechanism in any way, cannot be overlooked.

It is not, however, the consumer alone to whom the "Chelsea Three" offers important advantages. Saving is effected by the gas undertaking. It at once proceeds to cut down and finally eliminate the necessity for constantly changing meters already fixed or of altering the mechanism of meters of single coin capacity. It also has the important effect of saving capital outlay, as it undoubtedly reduces the number of meters required to be kept in the stores, to say nothing of the store space it also conserves.

Messrs. George Glover have now devised an ingenious attachment for fitting to the coin-box. This new fitment—the "coin separator"—which can be supplied as an extra when needed, separates the pennies from the silver coins and thus facilitates the counting of money when the collector calls to empty the meter.

The "Chelsea Three" Coin Meter.

It has been found that in some districts a two-coin meter (taking pennies and shillings only) will best meet the local requirements. For this purpose the "Chelsea Two," which is a slightly cheaper meter, has now been introduced. This is a companion meter to the "Chelsea Three" and differs only in that it is designed to take two coins instead of three as in the parent meter—all other features are the same, and the coin separator can be fitted to the coin-box as an extra. As there may be a demand, however, for a coin mechanism restricted to the use of one or other of the two coins the "Chelsea Two" has a simple device which will give this limitation if desired.

It will be useful to recall some of the other advantages which are common in both meters. A special self-locking device is provided, and this overcomes the use of sealing wax to prevent access to the prepayment mechanism. The insertion of the cash drawer (which is secured by padlock as usual) automatically locks the cover of the attachment.

The simple price-changer has a range of from 6 to 38 c.ft. of gas for one penny and *pro rata* for sixpence and a shilling. The rate at which the meter is set is clearly indicated inside the meter, for the information of the setter, and is also seen outside the meter for the convenience of the storekeeper. This exterior rate indicator, also the coin slot, money-box, self-locking device, and padlock are all accessible from the front of the meter. These are among the most conspicuous of the many advantages these meters have to offer. On Messrs. George Glover's stand there are further interesting features, including the full range of "Chelsea Three" and "Chelsea Two" meters in standard and high-capacity sizes. There is also an exhibit of these meters for use with gas fires in hotels.

Thomas Glover & Co., Ltd.,

48, Grosvenor Gardens, London, S.W.

The specialized study which has been devoted to perfecting the mechanism of dry gas meters is reflected in the products which may be inspected on this stand. Chief among these is the new pattern prepayment meter, which is constructed to take coins of two values. From the technical point of view, the outstanding feature is perhaps to be found in the prepayment mechanism. This has been designed to obviate excessive strain. Instead of the conventional pin and cam lever, the mechanism embodies a worm and wheel action, by means of which the minimum amount of applied pressure will produce the maximum results. The various parts which are used in building up this and other types of meters are shown separately, and provide striking evidence of the high degree of finish and robust character of the manufactures of this firm. In the meter under particular notice, the prepayment attachment is a self-contained unit and can be detached from the ordinary part of the meter, a feature which will appeal to gas undertakings who prefer to do their own repairs.

Grant & West, Ltd.,

17, South Street, London, E.C.

This firm exhibit seven of their best-known specialities—namely, "Belfo" belt food and treatment, "Selek" metal to metal jointing material, "Plastiloy" plastic metallic packing, "Ropres" steel wire rope preservative, "Revomer" rust solvent, "Flinso" tinning compound, and "Flinso" aluminium solder.

"Belfo" is a British-made belt food, and has been specially prepared by the manufacturers for the treatment of all forms of belting, including leather, hair, balata, cotton, composition, and link. It is a belt food, distinct and apart from a belt dressing, and while making the belt slip-proof, at the same time feeds and preserves a belt, increasing its life and rendering it impervious to the destructive action of workshop conditions. "Ropres" is a product which has been specially designed for the treatment of steel wire ropes used for haulage and kindred conditions. The effect of "Ropres" is to penetrate right into the heart of the rope, lubricating each individual strand, and rendering the rope waterproof, damp-proof, and acid-proof.

"Selek" is a jointing material in powder form, which in practice forms a non-oxidizing, non-rusting joint, guaranteed to withstand any temperature or pressure of steam, super-heat, water, gas, brine, alcohol, petrol, spirits, oil, chemicals, &c. "Plastiloy" is a plastic metallic packing, having the unique advantage that it is a "one-size packing for all sized rods and glands." It is plastic, anti-frictional, self-lubricating, and the anti-frictional metal in its composition has a higher melting point than any other metal yet produced.

"Revomer" rust solvent is a composition for removing rust, and is guaranteed to shift the most obstinate rusted-up bolt within five minutes. "Flinso" tinning compound cleans and tins all metals except aluminium, without previous cleaning and tinning. "Flinso" aluminium solder is a new process for soldering aluminium and its alloys at low temperature—*i.e.*, 160° for sheet work and 250° for cast. The "Flinso" process is non-oxidizing and non-corrosive, is electrically and mechanically sound, and makes a repair as strong as, and in some cases stronger than, the original.

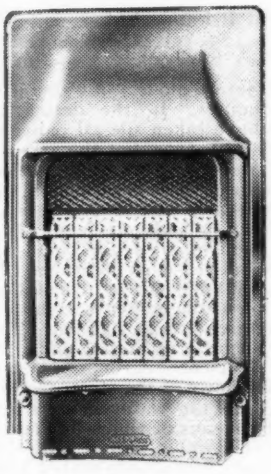
John Harper & Co., Ltd.,

Albion Works, Willenhall.

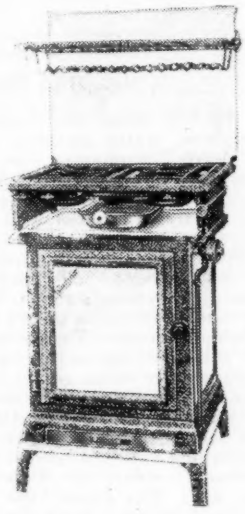
This firm are showing their "Beatrice" gas fires. The construction of these fires is simple and robust, with the smallest possible number of component parts. The burner is of compact design. Particular attention has been paid to the shape of the mixing chamber and venturi or choke tube. The burner is fitted with gunmetal teats, turned from a solid bar, which have long life and are easily removable for cleaning purposes. The patent injector gives triple disintegrating action to the gas as it passes through into the burner, thus producing silent burning and economical consumption of gas. The injector is provided with an air adjuster and a pressure control device. The adjustment is a very simple matter. The flue outlet fitted to "Beatrice" fires is more than adequate to carry away the products of combustion, thus rendering the fire perfectly healthy and a sound means of ventilation. "Beatrice Sunglow" radiants have all the constituents of healthy

heat, together with a bright appearance quickly attained when lighted. All parts of the fire which require cleaning or replacing, such as firebricks, &c., can easily be removed without disconnecting the complete fire from the grate. The finishes are art black and vitreous enamels in the following colours: White, French grey, ruby, golden green, brown, and royal blue. These are indistinguishable from porcelain, and can easily be kept clean by wiping with a damp cloth.

A new model fire called the "Viceroy" has just been placed on the market, and it is shown in our illustration. This is finished in art black and nickel plated fender top and adjustable flue outlet.



"Viceroy" Fire.



"Beatrice" Cooker.

The "Beatrice" cooker exhibited is made in two sizes; the simple, but effective, construction of the oven with its cellular asbestos packing retains a cooking temperature with a very small consumption of gas. The cooker can be supplied with or without thermostat, and its grey mottled and white enamelled finishes are of the highest quality. Regarding the hotplate, the bars are made in two sections only, and each one is interchangeable and cannot be replaced wrongly. Drilled ring or turret boiling burners can be supplied to order, as they are interchangeable. The "Beatrice" gas radiators exhibited are constructed of cast iron top and base, and steel tubes. Baffle plates are fitted in the top of each tube to prevent rapid dissipation of heat. This radiator is fitted with white-flame Bray burners instead of the bunsen type. The heat given off is perfectly healthy and agreeable, while the appearance of the radiator and its portability render it most suitable for halls, passages, or wherever heat is wanted from time to time. Simply constructed, and, therefore, not likely to get out of order. It is finished in art black or porcelain enamels, and can be supplied with or without gas governor. A smaller edition of this radiator called the "Clifton" can be supplied.

Hick, Hargreaves, & Co., Ltd.,

Bolton.

This Company have for many years been engaged on the manufacture of turbine machinery, and have now put on the market turbo and rotary air or gas compressors, blowers, and exhausters, capable of meeting all requirements for various industrial purposes.

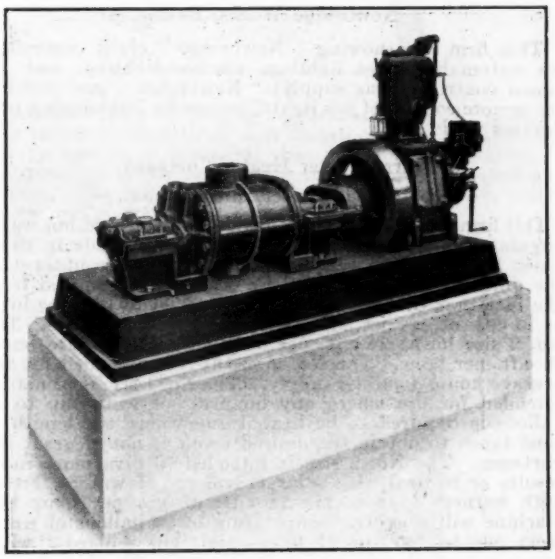
Two types of rotary machines are exhibited on their stand, and it is claimed that they are the only representative type built in this country capable of working up to high pressures. The machines are built in single and two stages with capacities from 12 to 6000 c.ft. per minute and pressures up to 250 lbs. per sq. in. They are also suitable, without alteration in design, as vacuum pumps up to 99·5 p.ct. vacuum. The machine is known as the positive or "cellular" type consisting of a main cylinder within which is arranged a rotor placed eccentrically, thus forming a crescent-shaped space between them. This crescent-shaped space is divided by the blades into a number of cells according to the pressure at which it is to operate, and they in turn expand from a minimum to a maximum capacity (suction period) and then decrease to a minimum capacity (compression and delivery period). The blades in the rotor are free acting, and practically the whole of the centrifugal thrust of these are taken up by restraining rings, restricting and controlling their pressure against the walls of the cylinder. Restraining rings rotate with the rotor, and in consequence the rubbing pressure is reduced allowing the machine to run at high speeds without vibration or wear. The most striking modification on the larger machines is the flexible mounting of the cylinder by which it is free to move under expansion and contraction. The inlet and outlet ports are arranged in adjustable rings at each end of the machine, giving a straight through flow of air from suction to discharge, thereby reducing frictional losses.

Exhibited also is a motor-driven single-stage water-cooled compressor for air or gas with a suction capacity of 425 c.ft. per minute at 720 r.p.m. and suitable for pressures up to 60 and 70 lbs. per sq. in. Another exhibit is the two-stage water-cooled compressor with inter-cooler between the stages mounted above the cylinders. The capacity of this machine is 50 c.ft. per minute at 1940 r.p.m. and suitable for a pressure up to 200 lbs. per sq. in. Automatic control and mechanical lubrication are fitted with flexible couplings between the motor and first and second stages. The inter-cooler is of the tubular type with brass tubes and plates of ample surface and arranged on the counter current flow principle.

W. C. Holmes & Co., Ltd.,

Huddersfield.

The exhibits consist of the firm's small high-speed Holmes-Connersville exhauster, which is in operation, electrically-driven air blowers, for revivifying purposes, and a 1½ million c.ft. per day Holmes-Connersville station meter, which is also in operation. The blower exhibited, in addition to being useful for oxide revivification *in situ*, is useful for a number of purposes where positive delivery at pressures up to 10 or 12 lbs. per sq. in. is required. The blowers, exhausters, and boosters, by reason of their special design, are suitable for driving by means of an electric motor, gas or oil engine, or high-speed steam engine, coupled direct to the impellers without the use of speed reduction gear.



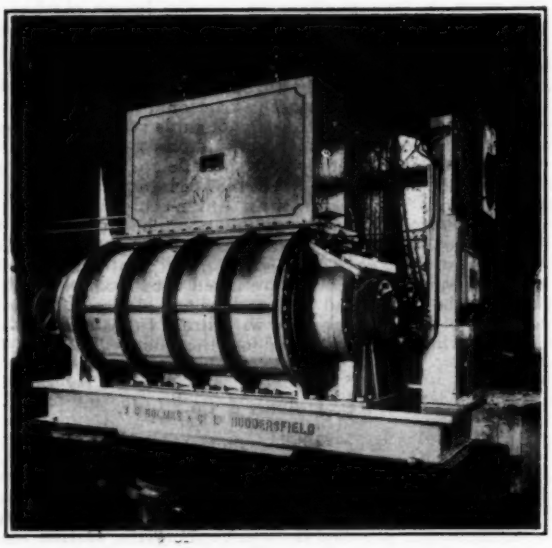
Holmes-Connersville Exhauster Direct Connected to a National Gas Engine.

Capacity, 6000 c.ft. of gas per hour.

In addition to the above examples, photographs, flow diagrams, and drawings are exhibited, describing various special processes of which the firm are the patentees and builders in connection with their business as gas and coal bye-product engineers, such as benzole, ammonia, and naphthalene recovery, gas cooling, tar extraction, and general gas purification. A collection of models and such apparatus are also shown.

Of special interest are the particulars and drawings of a new process which has secured widespread adoption by the important gas undertakings of Great Britain, and certain towns on the Continent, known as the Holmes "Dri-Gas" process, which is designed to remove the condensable moisture and water vapour contained in coal gas, which has hitherto been a source of trouble by reason of condensation in the street mains, service pipes, and meters on con-

sumers' premises. By a process of absorption this moisture is now separated from the gas immediately before distribution to the gas-works. Plants for this purpose are now



Holmes-Connersville Patent Positive Displacement Meter.

Normal capacity, 6,000,000 c.ft. of gas per day.

in course of construction at all the works of the Gas Light and Coke Company, including the works at Beckton, which is the largest gas-works in the world.

Horstmann Gear Company, Ltd.,

Newbridge Works, Bath.

This firm are showing "Newbridge" clock controllers for automatic street lighting, window lighting, and all timed control of gas supply; "Newbridge" gas switches for remote control of gas lights; gauges for engineering production work.

Hurry Water Heater Company,

39, Broad Street, Birmingham.

This firm are showing the "Hurro" gas-heated hot water circulator in operation. This circulator is made in three sizes, and the wide range of heating power contained in the different variations of these sizes can be gauged from the fact that the No. 1 size can be fitted to burn as little as 15 c.ft. of gas per hour (with the burners full on). The No. 2 size burns 24 c.ft. per hour. The No. 3 size burns 48 c.ft. per hour. The No. 2 size is recommended for the average house domestic supply. The No. 1 size is primarily intended for use where any quantity of water up to 30 gallons is required to be heated and where the length of time taken to obtain the desired result is not of great importance. The No. 2 size is intended to give more rapid results or to deal with a larger volume of water. Fitted with burners to consume 24 c.ft. of gas per hour this machine will raise the temperature of 30 gallons of water from 50° to 140° in 2¼ hours and will replace "withdrawals" of 2½ gallons in 10 minutes. The No. 3 size, fitted with burners to consume 48 c.ft. of gas per hour, will raise the temperature of 30 gallons of water from 50° to 140° in 1¼ hours and will replace withdrawals of 5 gallons in 15 minutes. Fitted with burners to consume 64 c.ft. of gas per hour this machine will raise the temperature of 30 gallons of water from 50° to 140° in ¾ hour and will replace 10 gallons of withdrawals in 15 minutes. Among the advantages of the "Hurro" circulator are the ease with which it can be fitted to any system and the fact that it can be taken to pieces for cleaning purposes in a very few minutes. The burner base is held by a few screws only and to get at the water-way for cleaning purposes it is only necessary to undo some few screws, prise open the rubber water joint, and unscrew the brass union at the head of the machine.

The firm are also showing in operation their dual-purpose gas copper, which delivers hot water to a bath or can be utilized for boiling clothes; together with their mottled enamel wash boiler, which is supplied complete with chromium plated draw-off tap; powerful and economical burner fitted with gas and air adjuster; condensation tray; strong copper pan, tinned on the interior; with outer case of heavy gauge steel, and boiling rim of cast-iron, both finished on exterior in best quality mottled enamel and on reverse side in plain enamel. The lid is made of Firth "Staybrite" stainless steel; the combined steam and flue outlet is finished in mottled enamel, or alternatively separate box condenser in stainless steel with flue outlet at the back.

Joymanco (Brighton), Ltd.,

Cambridge Grove, Hove.

"Masterpiece" meters—standard and high-capacity; ordinary and prepayment—are shown on this firm's stand. The "Joymanco" patent diaphragm is a prominent feature of the exhibit.

Junkers & Co. (Great Britain), Ltd.,

244, High Holborn, London, W.C.

On this stand are shown the latest models of "Ascot" geysers, water heaters, and boilers. In the design of "Ascot" appliances, the firm have taken special pains to improve not only the efficiency and service, but the appearance as well. In all "Ascot" water heaters condensation is totally eliminated, and, therefore, there is no possibility of corrosion. All appliances are either chromium-plated or white porcelain enamelled, and can be sponged clean.

The "Ascot" all enamelled multi-point geyser, made in two sizes, embodies in its design entirely novel features. It is easily taken to pieces and any part can be dismantled independently. The construction of the geyser is such that it will give long service ensuring greatest satisfaction. The appearance of the geyser is particularly attractive and adds to the decoration of the house. "Ascot" chromium-plated storage water heaters are well-known. The temperature is thermostatically controlled, and the water heaters are provided with a mixing valve by means of which hot water at any temperature, as well as cold water, can be obtained at will. The latest type "Ascot" chromium-plated sink geyser is being shown for the first time. This small geyser has a very wide field of application. It takes the place of the cold water tap over the sink and has two separate cocks, one for cold and one for hot water. By manipulating the two cocks, water at any temperature can be obtained. The geyser can be fitted with different fittings, such as a swinging spout, rubber spray, loop shower, &c., and can thus be adopted for a variety of uses.

The "Ascot" chromium-plated and white enamelled bath geyser are shown complete with a white hand shower. This geyser is neat in appearance and efficient in working.

George Kent, Ltd.,

Luton.

The exhibits of George Kent, Ltd., embrace measuring and control appliances of great utility in gas manufacture and distribution. Gas meters are represented by the Kent shunt gas meter, which provides an accurate and cheap means of measuring bulk supplies. The meter is increasingly used for both station metering and for the measurement of distribution mains.

The Kent automatic gas controller is also shown, which has been developed to control the pressure of gas in high-pressure distribution mains. The apparatus is entirely automatic and is based on previous experience that shows for a given hour in a given day of the week the gas supply will not vary very much from the average, and hence the controller ensures that a predetermined pressure exists in the distribution main so that an efficient pressure will always exist at the end of the main. In addition to the above, a complete range of steam meters, air meters, manometers, and recording apparatus are exhibited for the control of various fluids in gas manufacture. Water meters for the measurement of either hot or cold water are also exhibited.

Lighting Trades, Ltd., and the Welsbach Light Company, Ltd.,

30/31, Farringdon Street, London, E.C.

This exhibit comprises working demonstrations of the manufacture of incandescent gas mantles, a comprehensive range of modern lighting fittings, burners, and gas fires.

The manufacture of gas mantles has in past years proved of great interest to visitors to the Gas Section, and it is anticipated that it will again do so. Limitation of space does not, of course, permit of every process being shown, but the important ones, including knitting of ramie fibre, ring-typing, pleating, sewing, burning-off, and shaping, will serve to convey the general manufacturing routine. Adjacent to the working machinery is a large pyramid on

which are displayed specimens of the various types of mantles manufactured by the firm at their factory at Earlsfield, S.W. 18. These range from a mantle used for lighthouse work (measuring approximately 9 in. high) to one used for lighting stairways (measuring approximately ¼ in. high).

Modern tastes in lighting fittings favour those of the panel type, and the examples displayed on the stand are representative of the wide and varied range which the Company can supply. Another product which is prominently featured on the stand is the " Renown " magnesia cluster burner which is recommended and used largely for street lighting work. A special demonstration rail is fitted with specimens of the more commonly used patterns, varying from a 2-light Bijou or No. 2 to an 8-light size. " Renown " cluster burners are supplied with the nozzles arranged in differing formations. Other types of burners for domestic and outdoor use are also displayed.

A part of the space available on the stand is devoted to exhibiting specimens of the Company's various types of gas fires, special prominence being given to the popular Welsbach " Handiheater."

Donald Macpherson & Co., Ltd.,

Knott Mill, Manchester.

The design of this firm's stand impresses one as being both enterprising and practical. The office in the centre of the stand takes the form of a Chinese Pagoda, piquantly characterizing the firm's brand name " Foochow," and showing in an interesting way the results obtained with the well-known decorators' materials bearing that name —" Foochow " enamels, flat oil paints, and water paints for the decoration of showrooms, offices, engine rooms, &c.

The progress which has been made by Donald Macpherson & Co., Ltd., in applying their long experience of industrial paints to the needs of the gas industry—in the form of steel preservative paints and finishes for distributive equipment and appliances—is also demonstrated in a particularly interesting and convincing manner.

The Gas Section of the Fair is painted throughout with " Foochow " water paint, while some of the structural steelwork of the Fair buildings is preserved with " Foochow " enamel paints.

R. & A. Main, Ltd.,

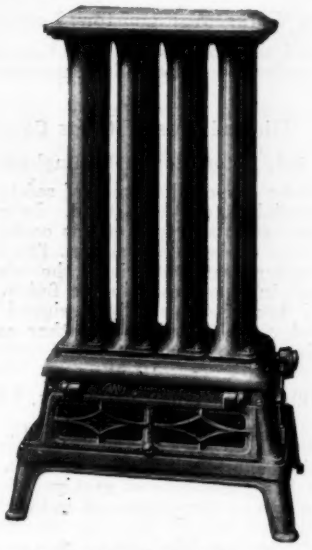
Gothic Works, Falkirk.

This stand houses a comprehensive display of the firm's most recent manufactures in gas cooking and heating appliances. Domestic cookers designed to brighten the kitchen, lessen labour, and increase efficiency are shown in the new " Mainamel " finishes—De Luxe, mottled, and mottled " B." These cookers are fitted with the patent " Conservor " oven, which gives an even temperature from top to bottom, enabling cooking to be done on every shelf. The oven heat is controlled by the red dial front-view " Mainstat," which is easily read, accurate in working, and assures the most successful cooking results being repeated time and again with certainty.

" Mainstat " Oven Heat Control.

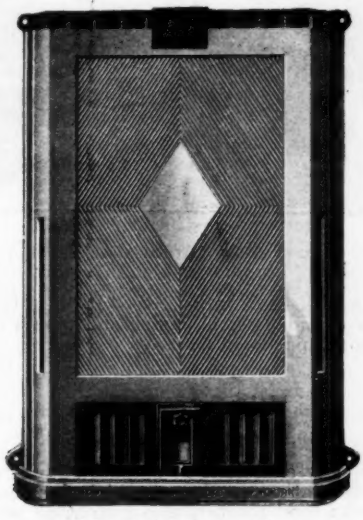
The " Wessex " series of cookers in dapple enamel finish deserve special mention. These are fitted with the new " Thermomain " oven-heat indicator. In the smaller sizes these cookers are particularly suitable for small families and for installing in confined spaces. They take up little room in the kitchen, are easily cleaned, and present a handsome appearance. A contrast in catering capacity will be found in the examples of heavy cooking apparatus for restaurants, &c.

The gas fires on view combine efficiency with artistry of design, and are shown in electro bronze, armour bright, sheathed copper, lacquer colour, and chromium finishes. Upright and inset types are displayed, also the portable " Mainscreen " fire, which can be converted into a fire-screen when not in use. All the fires are equipped with the " Raymain " radiants, which heat up rapidly with a more even glow from top to bottom and give out a smooth, comfortable heat. It will be noticed that several of the " Shakespearean " fires are of curved front design, which new note enhances their adaptability to alternative schemes of decoration.



No. 2004R " Unimain " Radiator on Stand.

Another form of heating apparatus is the " Unimain " gas radiator, an entirely new design of steamless radiator. Every part is so accessible that it can be dismantled for cleaning or repair in five minutes—even if situated in a recess. The " Unimain " is shown in various sizes, and in black and gold finishes.



" Romain " Panel Heater.

There is also the " Romain " heater of novel wall panel design, having a large radiating surface and small projection from wall, giving good distribution of heat and saving space.

R. Marsh & Co.,

Riverbank Works, London, E.

This firm are showing samples of their lead work, principally their homogeneous lead lining, which, it is understood, is being exhibited for the first time in this

country as an entirely British manufacture. The firm are of opinion that this homogeneous lead lining has a very big future. Advantages claimed for homogeneous lead lining are: (1) It can be used for all types of plant, whether working under pressure or vacuum, without blistering; (2) it will withstand vibration, and is thus suitable for vessels working with agitators or mixers; (3) sagging and creeping is entirely avoided; (4) the nature of the lead is not impaired, in fact the lead is just as good after application as before; (5) maintenance and repairs are reduced to a minimum; (6) repairs due to local corrosion or accidental damage are easily effected without stripping the remainder of the vessel; (7) the life of homogeneously lead lined vessels is considerably longer than those lead lined in the usual manner.

Metropolitan Fuel Company, Ltd.,

Empire Works, Walthamstow, London, E. 7.

On this stand the Cox system of radiant heat produced by flameless surface combustion is demonstrated.

Midland Brass Fittings Co.,

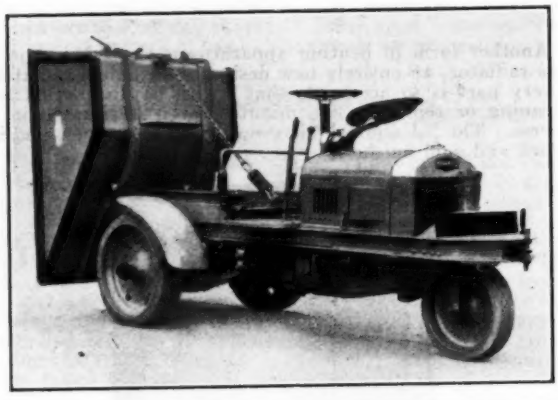
181, Aston Road, Birmingham.

This firm make a special feature of safety gas cocks, in which they specialize, on their stand. In a very comprehensive display, popular types of gas cocks, both for gas fires and for gas cookers, are shown, fitted with various "Midland" patent safety devices, the whole forming a complete range in every conceivable finish. "Midland" pendants and brackets specially designed to conceal a distant control cable constitute another exhibit on this stand which is sure to arouse interest.

Millars' Machinery Company, Ltd.,

Pinners' Hall, London, E.C.

An interesting exhibit on this stand is a three-wheeled vehicle which has great ease of manipulation. It is used extensively in almost every class of industrial works such



Millars' Tructractor.

as steel works, gas-works, &c. It is fitted with a 16-H.P. four-cylinder petrol engine and with a body with a load-carrying capacity of 36-cwt.

Moler Products, Ltd.,

49, Moorgate, London, E.C.

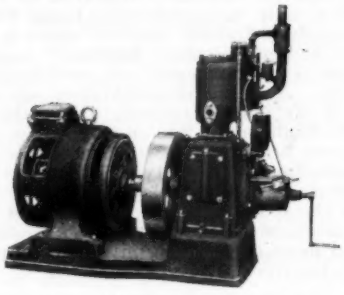
This Company exhibit their standard range of "Fos-al-sil" heat insulating products, which include insulating bricks, blocks, and mortar, also insulating powder and a special type of insulating aggregate, from which a strong and highly efficient insulating concrete can be made, this latter being particularly suitable for base insulation of heavy plant and also for furnace doors, &c.

A small muffle furnace so constructed as to demonstrate the effect of insulation is in operation. One side of the furnace is built of firebrick, the opposite side is of "Fos-al-sil" insulating slabs, the joints of which are made with "Fos-al-sil" insulating mortar, while the end of the furnace is built of insulating bricks, the joints being made with ordinary mortar. The door is constructed with insulating concrete. By this arrangement, a good indication of heat losses through the various types of walls so obtained.

National Gas Engine Company, Ltd.,

Ashton-under-Lyne.

This firm show their "5V" Type Gas Engine, which develops 3½ to 5½ maximum h.p. on town gas at speeds from 650 to 1000 r.p.m. It is a totally-enclosed four-stroke cycle engine of high standard for sale at a low price. The engine



National "5V" Type Gas Engine. Driving Dynamo 3½ to 5½ B.H.P.

on view is arranged for cooling from a separate water tank, but for intermittent running an engine of the hopper type is available. Complete pumping, lighting, or air compressing sets, embodying this engine, and for running on either town gas or paraffin can be supplied.

New Geysers, Ltd.,

25, Addington Square, London, S.E.

This firm are showing geysers and storage heaters to meet all requirements—heated by gas, oil, and wood fuel.

Considerable interest is likely to be displayed in their "White Chief" geyser, which is something entirely new. A closed type machine of high efficiency, the "White Chief" has a separate outer case of heavy welded steel, white porcelain enamelled, and mounted on the patent sliding pattern "access base," which, together with improved interlocking taps and vent socket, is finished in chromium plate, and the whole presents a very pleasing appearance. The "White Chief" meets a long-felt want for a white porcelain enamelled geyser for the better class bath-room, and has already gained very marked popularity.

P. B. Sillimanite Company, Ltd.,

Salisbury House, London Wall, E.C.

It is claimed that the addition, in predetermined qualities, of Sillimanite to all bricks, elements, firebars, &c., as well as to wire-setting cements has been proved greatly to increase electrical insulation properties, mechanical strength, and resistance to thermal shocks. The chief characteristics of the material are summarized as follows: (1) High softening point, well over 1800° C.—3200° Fahr.; (2) perfect stability to its actual softening point; (3) very low co-efficient of expansion, which enables it to withstand sudden and severe changes of temperature; (4) freedom from volume changes; (5) neutral reaction—that is, it is neither acid nor basic; (6) great resistance to the corrosive action of many slags and abrasion of moving charges; (7) equally efficient in either oxidizing or reducing atmospheres; (8) great strength, which is maintained up to softening point; (9) very high electrical insulation, cold, and at high temperature; and (10) moderately high thermal conductivity. Many examples of the uses to which the material can be put, together with various specimen pieces, are shown on the stand.

W. Parkinson & Co.,

Birmingham.

Messrs. W. Parkinson & Co. are showing on their stand a complete range of gas meters, including ordinary and prepayment patterns, dry meters of specially high capacity, and test meters for experimental purposes, designed for great accuracy under a variety of conditions. There are also models of large wet meters, both cylindrical and rectangular. In governing apparatus this firm is showing, in addition to the models of the ordinary station governor, an actual governor tank adapted for pressure loading, together with pilot governor, used to load the main governor. This pilot governor can be fixed at a distance from the main governor, and the convenience of this system of regulating the pressure on a district is obvious.

On this stand there is also a selection of modern street lighting apparatus, including lamps of square design, and arc lamps for "U" fixing and suspension. It is interesting to notice the various designs of burners fitted in these

lamps. The type of burner with mantles in alignment is employed for both square lanterns and arc lamps, and a distinct advantage over the cluster burner is claimed if this method is adopted for ordinary street lighting, where it is important to secure maximum illumination up and down the street. The " Blackpool " pattern lamp is also shown, with the patent burner arranged in tiers. The " Sheffield " patent directional reflector is seen to great advantage, used in conjunction with ordinary lamps, and also attached to the enamelled reflector of suspension lamps. With the " Sheffield " reflector, light rays, which would be otherwise wasted, are collected and thrown in the direction in which they will be most useful. This, and other reflectors, are shown made in polished stainless steel.

No. 840 B Type "GA" Lantern, with Patent "Sheffield" Directional Reflector.

Lighting engineers on the look-out for traffic devices, will find their requirements have been provided for by the " Parkinson " Fig. 511 series. This lamp is supplied with a ruby glass globe, and provided with ornamental arm attachment for fixing to lamp columns on island sites. This attractive design, we understand, has been adopted by several lighting authorities for use on such sites. The same class of lamp is also supplied with clear globe, and fitted with parabolic reflector for illuminating traffic danger signs. The latest patterns of preheated inverted burners are shown, the mantle in alignment type being much in evidence. These burners, as also those fitted in the lamps, are metallized to prevent corrosion. This treatment, besides increasing the efficiency of the burner, gives it a very pleasing " aluminium " effect.

The " Beasley " recording gas calorimeter is shown on the stand, complete with pressure and temperature correcting mechanism and automatic waterlining tanks. This instrument, while requiring the very minimum of attention, gives a record of the calorific value in B.Th.U. per c.ft. corrected to normal temperature and pressure, irrespective of variations in barometric pressure or in the temperature or density of the gas.

There are a large number of other exhibits on view, including pressure gauges in great variety, both of the double-tube and single-tube patterns; main thermometers, vaporizers, force pumps, &c., so that any engineer visiting this stand can rely on finding something of interest.

The Parkinson Stove Company, Ltd.,

Stechford, Birmingham.

This firm have staged a striking exhibit of gas cookers, fires, radiators, and water heating equipment, which, though it is representative of but a part of the firm's production, indicates the great advances which they are making in design, construction, and finish of their appliances.

The examples of Parkinson cookers include the popular " New Suburbia," with one-burner oven and automatic oven heat control, the "Suburbia," "Liverpool," and other types, in a variety of mottled and beautiful self-coloured porcelain enamelled finishes, In addition to the cookers fitted with the " Ajusto " regulator for oven heat control, several examples equipped with the firm's oven-heat indicator—a visible guide to oven temperature—are also on view. The " Stechford " cooker, an excellent model for a very small house or flat, is also shown.

Another attractive section of the exhibit includes many fine examples of Parkinson " Hygienic " gas fires in sheathed metal, bronze, and art silver finishes, as well as the more ordinary art finishes.

A feature of particular interest is the new " Luminous " radiator, with translucent door panel, diffusing a pleasant glow. This appliance combines the economical heating features of the air heater with the attractions of the luminous heater. It circulates healthy heat without any tendency to vitiate the atmosphere. A reliable governor is fitted to ensure satisfactory working under varying gas presures, and the reflector is chromium plated and rustless.

One of the oldest branches of the Parkinson Stove Company—that of water heating—is represented by a variety of modern apparatus, including the " Treasure " and " Pearl " geysers, " Gacylettes," the " Hydrotherm " (an economical water heater with automatic gas control), and the " Hot Spring " storage heater, which makes its first public appearance at the Fair, and particulars of which are as follows :

This storage heater is a neat, cylindrical, self-contained apparatus, entirely automatic in operation; and, owing to the very low gas consumption necessary to ensure a continuous supply of hot-water, it is remarkably economical in use. It has a rated capacity of 20 gallons, and operates in conjunction with a cistern. When the temperature of the water falls, due to the withdrawal of hot water, the gas supply is automatically increased by a thermostatically controlled gas valve, and *vice versa*. The heater is, of course, permanently in operation, and hot water is always available. The normal maximum gas consumption is from 10 to 12 c.ft. per hour, which is automatically reduced to $1\frac{1}{2}$-$2\frac{1}{2}$ c.ft. per hour when the predetermined water temperature is attained. When heating up, approximately $4\frac{1}{2}$ gallons of water at 135°-140° Fahr. are available after one hour.

The " Hot Spring " storage heater is constructed in heavy gauge copper or galvanized iron, as required, and is fully lagged to prevent the loss of heat. By removing the door and unscrewing two connections, the heating unit can be readily withdrawn for cleaning. A safety pilot is fitted which automatically cuts off the gas supply in the event of the flame being accidentally extinguished owing to draught or any other cause.

There are no awkward projections on the storage cylinder, and the whole construction is exceedingly simple and reliable, experience proving that this storage heater will operate without attention for long periods. The " Hot Spring " is made on the " stratification " principle, which permits of small quantities of hot water, if required, being withdrawn from the container shortly after lighting up.

An ingenious capacity gauge (patented) which indicates accurately the amount of hot water in the container, can be fitted at a small extra charge.

Radiation Limited.

The exhibits of the six constituent firms of Radiation Limited are described under their respective names.

Richmonds Gas Stove Company, Ltd.,

Warrington.

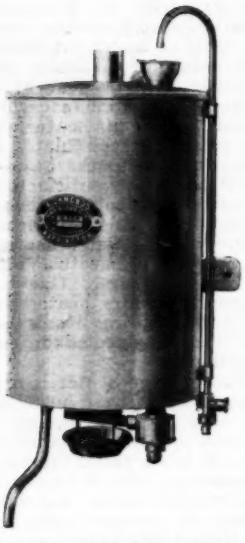
(Radiation Ltd., Proprietors.)

The " Bungalow New World " gas cooker is shown by Richmonds on this stand. The " Rado " porcelain enamel finish obtained at the Warrington Works is very attractive, and has demonstrated its hard-wearing capabilities to the full. The ease of cleaning these cookers is a point very greatly appreciated, and, added to this, the " Bungalow New World " has the single-burner and bottom-flue-outlet, with increased depth of oven space, enabling a whole six-course dinner to be cooked at the one time and at one " Regulo " mark without attention.

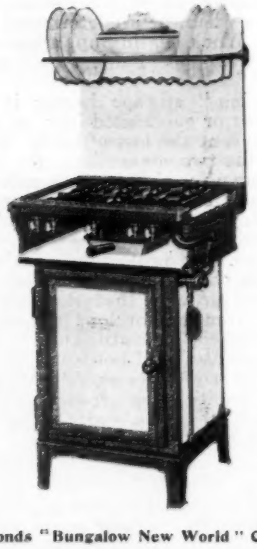
An example of the Richmond metal-clad finish in pewter is shown in their " Stuart " design. This fire has the " Injector-ventilator " and is fitted with "Beam" radiants, giving an increased proportion of the healthful infra-red rays of the spectrum. The design of the " Stuart " is very pleasing. The " Apex " gas-heated radiator is also shown on the stand.

A notable Richmond exhibit is the " Equator " gas-heated circulating boiler. This delivers small quantities of hot water for general domestic use to any part of the house soon after lighting the gas, and without waiting for all the water in the boiler to get hot. The full-on consumption is 55 c.ft. per hour, and with this, a hot bath is available in 40 minutes from cold. Further hot baths every 40 minutes can be obtained from the " Equator." The Richmond gas control cuts the consumption down to 2 c.ft. per hour after the water is heated, should it not be required

Richmonds "Equator" Water Heater.



Richmonds "Newlyn" Boiler.



Richmonds "Bungalow New World" Cooker.

Richmonds "Stuart" Gas Fire with "Dog" Fender, and "Beam" (Trade Mark) Radiants.

for immediate use. The "Equator" is a very economical proposition. Richmonds also show two of their "Lyn" boilers and a "Don" geyser, the latter finished in bronze and looking very attractive.

Sawer & Purves,

Nelson Meter Works, Miles Platting, Manchester.

Exhibited on the stand of Messrs. Sawer & Purves are consumers' meters in glass and tinplate cases, also various meter parts. This firm's two-coin attachment is shown for the first time, as is also their patent diaphragm. This diaphragm has a covering of oiled silk, thus enabling the leather to retain the lubricating oils and preventing the "drying-up" of the leather and prolonging the life of the diaphragms. A model coin collecting van is also exhibited, which, it is claimed, is a boon to slot meter collectors. Pressure gauges, main taps, and brasswork of all kinds made by the firm are shown, as is also a model test holder.

Sigma Instrument Co.,

Letchworth.

The Sigma Instrument Company is exhibiting recording and indicating calorimeters and pressure recorders. A modified Sigma B.Th.U. recorder is exhibited with a more open calorific value scale than formerly made. Another new exhibit is a combined B.Th.U. recorder and pressure recorder; the B.Th.U. recorder in this case is the one approved by the Gas Referees.

They also exhibit a new recording calorimeter in which the calorific value is determined by a rise of temperature of a stream of water. The water is weighed four times in each revolution of the gas meter maintaining a constant ratio between gas and water. The correction for temperature is applied at the pen operating mechanism by changing a length of one of the levers. In pressure recorders they exhibit both tape chart and circular chart instruments. The above instruments will be connected to the gas supply of the exhibition to record the calorific value and pressure.

Stourbridge Refractories Co., Ltd.,

Shut End Works, Pensnett.

This Company, formed in 1914, to deal with the manufacture of high-class refractory goods, has an interesting display of firebricks, blocks, tiles and retorts, and various cements, scientifically produced. The firm specialize in the production of vertical and horizontal retorts, segmental retorts, furnace linings, W.G. generator and regenerator blocks, chequer bricks, &c., for water gas plants, refractory insulating blocks, coke oven bricks, and blocks and firebricks of every standard size.

Realizing the need of suitable cements for work with their goods, the Company have placed upon the market special mixtures. Their "B" jointing mixture is ideal for work with silica bricks, while the No. 4 is very adaptable for use with fireclay material. Other grades of cements for various purposes are displayed, including Monolithic, which is of particularly good service for use in temperatures below 1000° C. It can be conveniently used for the manufacture of dampers and blocks for boiler settings of all descriptions and for bricks for use in the waste-heat flues.

Stoves, Ltd.,

Rainhill, Liverpool.

This firm have an exhibit of gas cookers, gas fires, hotplates, gas irons, and gas rings. The "Newhome" is a gas cooker of entirely new design and exhibited for the first time. The oven is a convenient size for general use, with a door opening 16 in. high by 14 in. wide, and can be supplied with one back burner and bottom flue, or two side burners and top flue. There is a choice of hotplates with two or three boiling burners and two types of grill—the patent circular or the straight pattern. It is finished in grey mottled porcelain enamelled or art black.

The "Bakerloo" high-grade series of grey mottled porcelain enamelled cookers are given prominence as the outstanding product. Handsomely finished and neatly designed, they are made in various sizes to suit the average needs; a new model is on view of intermediate size with increased boiling capacity. The "Reliable" is a smaller, but very efficient cooker finished in grey mottled porcelain enamelled or art black, suitable for homes with limited space. The "Autokook" oven-heat controller, which enables food to be cooked without watching, can be fitted to any of the above cookers.

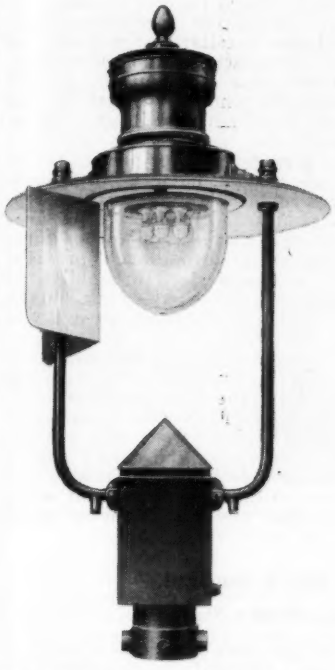
"Silo" gas fires have received a new impetus by the scientifically designed fuel—the "Briteray-Silo"—which is to be seen in action. Examples of artistic finishes are displayed, including mahogany and oak grained, oxidized silver, copper, and brass, in addition to art black. The "New Century" gas fire lighter, which is being demonstrated, enables a gas fire to be lighted with the ease of an ordinary switch. "Argyll" hotplates, "Glide" gas irons, and gas rings assist in completing the exhibit.

William Sugg & Co., Ltd.,

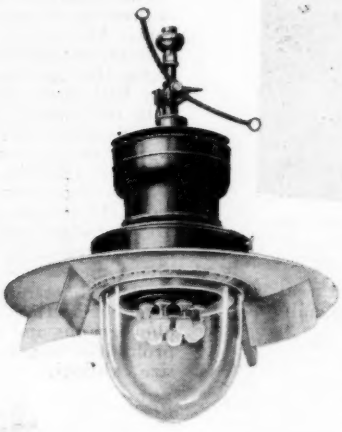
Ranelagh Works, Chapter Street, Westminster, S.W. 1.

On this stand gas for cooking, heating, and lighting is demonstrated to excellent advantage. For cooking, the well-known "Berkeley" cookers in mottled all-enamel finish are displayed, the exhibits including the new No. 10 model, which gives a good capacity oven even though occupying only a modest floor-space. Another model also adapted particularly to small households is the "Swift" cooker in mottled enamel finish.

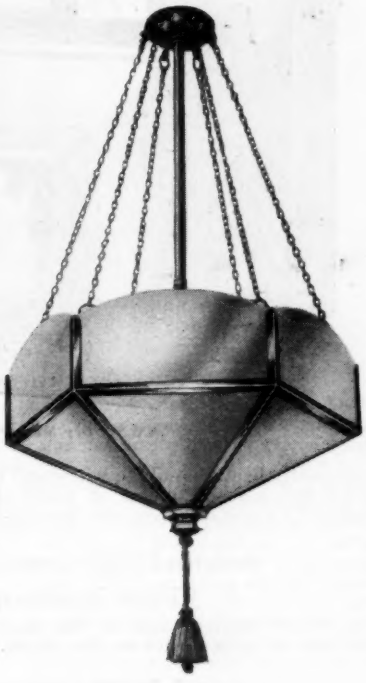
A fine collection of "Red Sphinx" gas fires is on view.



Upright "Rochester" with single type Directional Reflector.

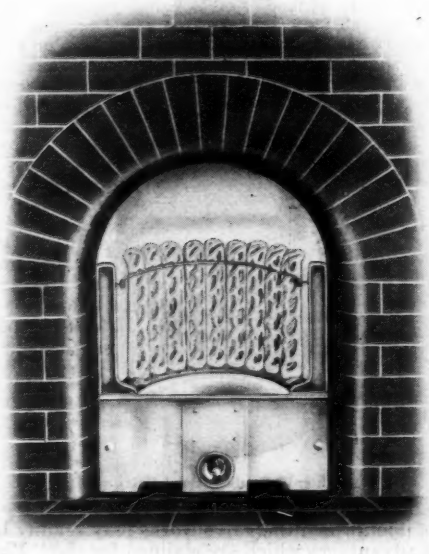


"Rochester" Suspension Lamp with rustless steel Directional Reflector.



The "Grand" Pendant.

All these fires embody the unique incurved fuel formation. When Messrs. Sugg first manufactured gas fires they favoured the inset type of fire, and the incurved fuel formation is the natural corollary to this idea, the aim of which is to get the fire directly under the flue where the products of combustion are carried away, just as with a coal fire.



"Red Sphinx" Inset Fire with firebrick setting and flat-front Fender.

The "Red Sphinx" is shown in many forms. There is the inset conversion type, designed to replace the ordinary coal grate by merely removing the bars; a somewhat similar model in firebrick setting, especially made for the fashionable flat-fronted fireplace without canopy, with which it harmonizes wonderfully well owing to the sparsity of metal work; complete interior fires for building-in, in many beautiful art-metal finishes; and also the independent type for use where no fireplace exists.

There is an excellent display of interior lighting appliances. Several most attractive "hidden-source" pendants are shown, and one worthy of particular mention is the new "Grand" pendant, which carries a switch for lighting and extinguishing in the tassel hanging below the pendant, which we illustrate here. Several other pendants are shown fitted with switch control, and, in this better-class gas lighting, taps and rings and chains seem entirely things of the past. Many of these switch controls operate by means of the reliable patent distant control device, manufactured by Messrs. Sugg. Another fitting which has proved of great interest is the "Worklite" lamp, a new type of fitting intended for factories and workrooms.

When we come to street lighting, Messrs. Sugg have a fine array of exhibits. Their "Rochester" lamp, which is now used so very widely for public lighting, is displayed in both upright and suspension forms, and also with various fitments for particular purposes, such as lighting policemen on traffic duty, carrying danger signals at cross roads, and so on. In connection with these lamps, as also with the "Windsor" and "Grosvenor" lamps exhibit, the new rustless steel directional reflector is worthy of careful attention. Polar curves are available demonstrating that the use of this reflector increases the light on the line where it is most needed—viz., at angles of from 10° to 20° from the horizontal—by no less than 100 p.ct. It is very strongly and ingeniously constructed, and since it is made from rustless steel the maintenance is practically negligible. Included in this section of the exhibit may be mentioned also conversion sets, various types of governor, and the patent distant control device taps in conjunction.

A feature which should not be overlooked, too, is the "G.L.C." gas poker, which enables an ordinary coal fire to be lighted without wood or paper and without the customary coaxing. This poker is presented in a very attractive form, and is a line which, we understand, is finding a good demand.

A. G. Sutherland, Ltd.,

Warwick Road, Greet, Birmingham.

This exhibit consists of various types of "A.G.S." dry gas meters. Considerable progress in construction and design is shown in the latest products of this Company, and there are many features of interest. Meters in various

stages of construction are shown, which enable close examination of their component parts. A new design of prepayment attachment (two-coin) is exhibited which is exceptionally heavily built to withstand very hard wear. The "A.G.S." gas fire meter of small size is specially constructed for use in hotels and boarding houses.

"A.G.S." Dry Meter.

Sutherland Meter Company, Ltd.,

Witham, Birmingham.

A representative range of the meters manufactured by this firm is to be found on this stand.

John & Joseph Taunton, Ltd.,

Balsall Heath, Birmingham.

High-capacity meters, both ordinary and prepayment, are the main feature of this firm's exhibit. They are made from first-class materials, and assembled by skilled craftsmen. A novel feature will be a working model of the "Taunton" gas "Tell-Tale" fitted to a 120 c.ft. per hour high-capacity meter.

J. Tennant & Sons,

Hawthorne Street, Warrington.

On this stand are shown several gas fires of leading makes, equipped with the exhibitor's well-known make of "Raydiants" in which they specialize. The display is specially designed to show the qualities of the "Raydiants," which incorporate the results of the firm's exhaustive experiments to produce a gas fire radiant which has not only structural strength, but which gives really high thermal efficiency, with a lasting, glowing brilliance.

Timmis & Co., Ltd.,

Stourbridge.

"Lava" highly aluminous refractories in various grades to cover a wide range of types of furnaces are exhibited by this firm, who also show non-spalling firebricks, insulating bricks, Stourbridge quality refractories, refractory cements and fireclays, and fireplace interiors.

F. Turner (Art-Metal), Ltd.,

61, 62, and 63, Summer Hill Street, Birmingham.

A comprehensive exhibit of Turners' Art-Metal Surrounds is shown, including their well-known adjustable surrounds, canopy surrounds, hearthplates, curbs, &c., in suitable settings. This firm are showing for the first time surrounds in their new "Enduro" art colour finishes, which have been introduced to match the art finish gas fires. "Enduro" finishes have a hard and durable surface which is permanent. They are not affected by damp or wet, and will not discolour in use. Curbs and hearthplates can be supplied to match.

C. & W. Walker, Ltd.,

Donnington, Shropshire.

Messrs. C. & W. Walker, Ltd., are exhibiting a large number of photographs of gas-works plant which they have erected in various parts of the world, also models of gas-works plant. There is also shown a full-sized section of the Milbourne-Beard india-rubber pad for purifier covers, also mild steel tee, with electrically welded joints and flanges, and full size section of 6 ft. diameter rotary washer scrubber showing interior.

The photographs include spiral-guided and guide-framed gasholders from 12½ million c.ft. capacity downwards, also dry Klönne holders, spherical pressure holders, Milbourne roller carriages and Milbourne truss, purifier installations, including those at Sydney, Melbourne, Bradford, Stoke, Bournemouth, and other large installations; welded steel mains, tar stills, steel and cast-iron pipes and connections, washer scrubbers (vertical and horizontal), Livesey washers, P. & A. tar extractors, condensers (with vertical and horizontal tubes), tanks (steel and cast iron), sulphate of ammonia stills, saturators, &c.

The Milbourne-Beard india-rubber pad for purifier covers is proving in actual practice a sound engineering proposition. The rotary washer scrubber shows adjustable type of bearings and wood devices attached to the rotating discs removable in segments through manholes in top or sides. The Milbourne roller carriage referred to above is provided with self-lubricating axles, and is of steel throughout, its long bearings ensuring parallelism in the axles for a lengthy period; its method of lubrication obviates the necessity of frequent attention.

They also show several types of flat grids with taper and parallel bars, also hurdle grids for purifiers. The flat grids are manufactured in a special manner to ensure rigidity, being afterwards planed perfectly flat. The photographs give some idea of the magnitude of the work they are able to undertake. With the exception of the rotary washer scrubber section, this firm are able to exhibit models and photographs and certain specialities only on account of the prohibitive amount of space that would be taken up by full size exhibits.

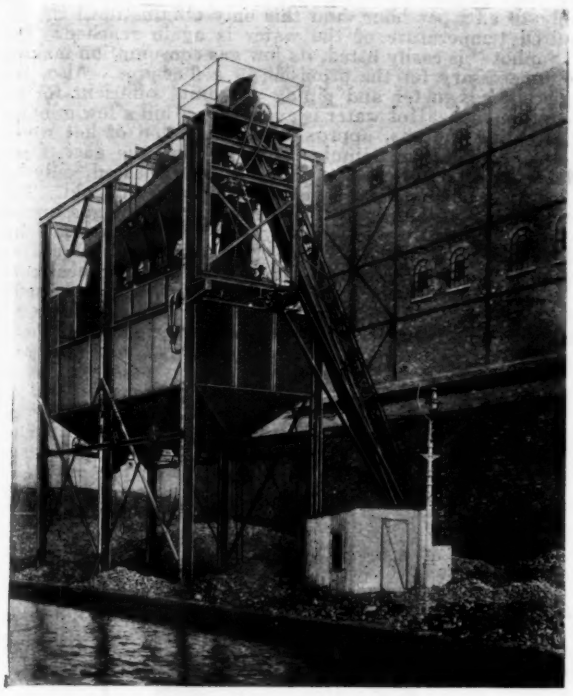
George Waller & Son, Ltd.

Phœnix Iron Works, Stroud.

The chief exhibit on this Company's stand is a range of sizes of their new "Phœnix" double-faced gas valve, the patent for which is applied for. The sizes shown are 3 in., 6 in., 12 in., and 18 in. diameter valves, the body of the 12 in. diameter valve being of skeleton type so that the principles upon which the valve works may readily be seen. The chief advantages which are claimed for the "Phœnix" double-faced valve are as follows: There are no springs or internal pins to break or perish. There is no obtruding wedge piece to obstruct the clearway. The valve will not stick even when left open or shut for long periods. Owing to the leverage of the quadrant immense pressure is exerted on closing, thus ensuring the tightness of valve. The pres-

Phœnix Double-Faced Valve.

sure is evenly distributed over the faces. The doors rotate positively in opening or closing, and clean the faces.



Coke Breaking, Elevating, Screening, Washing, and Storage Plant for 15 Tons per Hour.

These valves are supplied in two ranges: (1) For ordinary gas pressure tested to 30 lbs. per sq. in., and (2) high-pressure valve tested to 100 lbs. per sq. in.

The remainder of the exhibit consists of photographs and drawings of the plant manufactured by this firm, the chief items illustrated being of exhausting machinery; compressing machinery; "Michell" patent crankless compressor; "Retriever" pan ash and coke breeze washing plant; coke screening, elevating, and storage plant, &c.

Waterless Gasholder Company, Ltd.,

13, Rood Lane, E.C. 3.

Britain's first waterless gasholder (M.A.N. type) commenced operation in September, 1927. Since that date the waterless type has definitely established itself in this country; so much so that, by January, 1931, no fewer than 28 waterless holders had been ordered for Great Britain. These range in capacity from 250,000 to 8 million c.ft., and cover a variety of gas storage purposes—coal gas, water gas, coke oven gas, blast-furnace and producer gas, &c. The world total of waterless gasholders to date is upwards of 230.

The Waterless Gasholder Company, Ltd., are exhibiting a model illustrating the working principle of the M.A.N. holder. There is also on view a full-size section of the tar seal, which, to most people, is perhaps the feature of chief interest in the construction of the waterless holder. In addition, a number of constructional drawings are displayed, together with many photographs of British waterless gasholder contracts carried out by the licensee firms of Messrs. R. & J. Dempster, Ltd., of Manchester; Robert Dempster & Sons, Ltd., of Elland; Clayton, Son, & Co., Ltd., of Leeds; and E. Cockey & Sons, Ltd., of Frome.

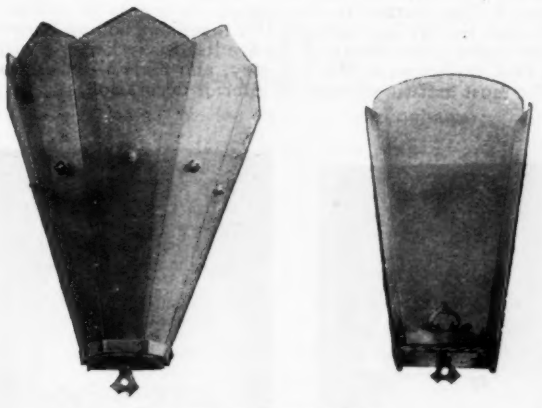
Welsbach Light Company, Ltd.

(See Lighting Trades, Ltd.)

Wm. Whitehouse & Co., Ltd.,

Empire Works, Brueton Street, Birmingham.

Messrs. William Whitehouse & Co., Ltd., are exhibiting modern designs of gas lighting fixtures. These include a range of exclusive panel gas brackets, complete with special by-pass burners. Some of these are particularly suitable for cinema lighting. The authorities insist that picture houses must have separate supplementary gas lighting, but, whereas all the electrical fittings are generally of an arresting nature, the gas brackets in evidence are quite unworthy of an important industry. In view of the fact that over two million people attend the cinemas of this country *weekly*, it is a serious matter that the gas industry should so advertise itself as the "Cinderella" of the lighting trade. These new brackets of Messrs. Whitehouse effectively fill a long-felt want, since they incorporate novel ideas, which should greatly interest the public.



Cinema Wall Panel Brackets.

Patent open-bottom bowl pendants are also displayed with the "Whitehouse Collar," by means of which the common half-inch pendant in regular use can be readily transformed into an article of beauty. "Silkose" and "Satinoid" shades are shown for the first time. The former is a new material, brilliant as glass, yet with the appearance of watered silk. The light absorption is *nil*, and these shades, which are very durable, are offered in any colour. "Satinoid" is an opaque white material, decorated in a great variety of charming designs. It illuminates without glare, and reflects a powerful light downwards. These shades are designed for use on ordinary inverted gas burners; they will not deteriorate, and are unbreakable and non-inflammable.

The firm are also showing improvements in gas fire cocks, main gas cocks, joints and small fittings of all kinds, including the patent "house" valve for ensuring silent gas fires.

Willey & Co., Ltd.,

Exeter.

A very fine and comprehensive display is made of high-capacity meters, and these meters, being open for inspection, every new development since the last exhibition is displayed to view. These meters can be made by Willey & Co., Ltd., to almost any capacity, and they have the advantage of increased capacities to cope with that extra consumption required, and also the reduced overall size allows a meter to be fitted in the minimum of space. There are also some further points of interest with these meters—*i.e.*, the patent flexible flanges, allowing easy mating and no distortion of the sides of the meter or valve plate, a frequent trouble in the old type. The automatic lubricating feed pump, or arrangement for oiling by use of squirt pump in the larger types, is a great advance in the right direction, as it allows the moving and bearing mechanism always to work easily, without those stoppages due to dry seizure or irritating noises.

Messrs. Willey & Co., Ltd., demonstrate other items of their manufacture, including their range of union cocks, &c., the cocks of fullbore being of special interest to the gas salesman.

The Vulcan Stove Company, Ltd., side of this firm are showing their latest types of gas cookers and fires. They claim their fires to be very efficient and silent.

George Wilson Gas Meters, Ltd.,

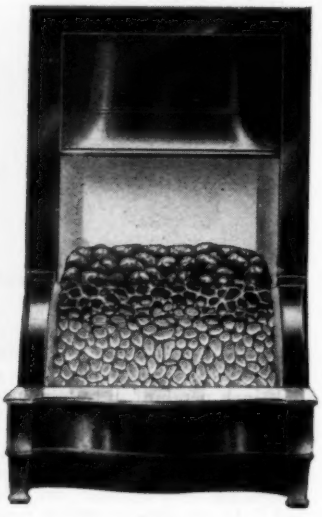
Foleshill Road, Coventry.

Among the various exhibits, such as meters, test meters, gauges, recorders, &c., this firm show the latest evolution of the high-capacity dry meter. This meter, called the "Beamo," is of advanced construction, and the method of valve operation is novel. They claim that, notwithstanding the difference in design, the old and well-tried method of valve construction has been strictly adhered to, and test results on this new type prove its efficacy. Arrangements are made on the stand for demonstration tests. This firm are also exhibiting a unique coke grate.

Wilsons & Mathiesons, Ltd.,
Leeds.
(Radiation Ltd., Proprietors.)

Among the exhibits of this firm are a " New World " " Regulo "-controlled gas cooker in porcelain enamel (small size) which is proving popular with gas undertakings all over the country. Wilsons new " Loga " gas fire, with concealed boiling burner in the canopy, is a notable exhibit. Although the fire incorporates this ingenious boiling burner in the canopy, the design of the fire itself is in keeping with the best traditions of the Industry, and finds a place even in the most artistic schemes of interior decoration.

Wilsons " Loga " Gas Fire, showing Boiling Burner in Canopy.

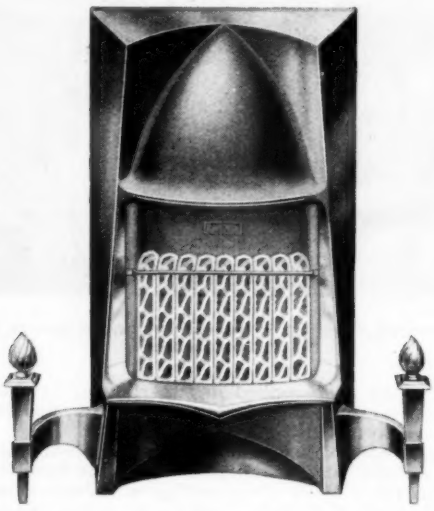


Wilsons " New Sunbeam " Interior.

Examples of their popular " New Sunbeam " dog grate are also shown, and the whole comprises an exhibit that does the Leeds works infinite credit.

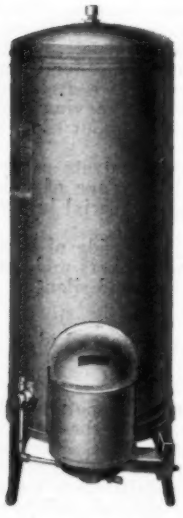
John Wright & Co.,
Birmingham.
(Radiation Ltd., Proprietors.)

One of the outstanding exhibits of this firm is a 20-gallon " Sunhot " water heater, finished in cream, with automatic cut-out and hot water indicating studs. By its new system of insulation, the efficiency attained is very high. Although there are only two small flat-flame burners, together consuming under 2 c.ft. per hour in the cut down position, the contents of the storage tank can be kept at 140° Fahr., ready for use indefinitely. The maximum consumption allowed by the " Regulo " control, when hot water is drawn off, is only 10 c.ft. per hour, and this only obtains until the required temperature of the water is again reached. The " Sunhot " is easily fitted, its low gas consumption making it unnecessary for the provision of a flue pipe. Also, the existing gas meter and piping are quite sufficient for its requirements. Hot water is available within a few minutes of lighting the gas, approximately a gallon of hot water being ready fifteen minutes after lighting the gas. Once the whole contents of the boiler becomes heated, only an exceptional demand can cause the supply to run cold. The lagging of the tank is so efficient that, with the gas turned off, the temperature loss is only 1° Fahr. per hour. John Wright & Co. also show a large " New World " gas cooker in porcelain enamel finish, with " Regulo " oven-heat control, single oven burner, bottom-flue outlet, &c., and one of their " Wren " fires in oxidized pewter, also a " Cresset " fire with dogs, in a very pleasing armour-bright finish.

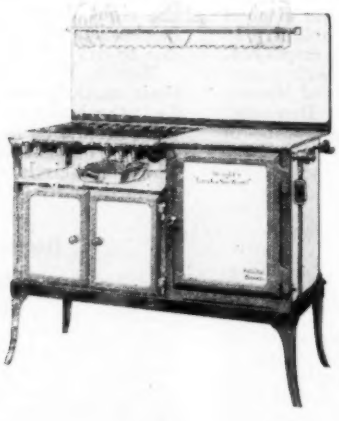


John Wright's "Cresset" Gas Fire, with "Beam" (Trade Mark) Radiants.

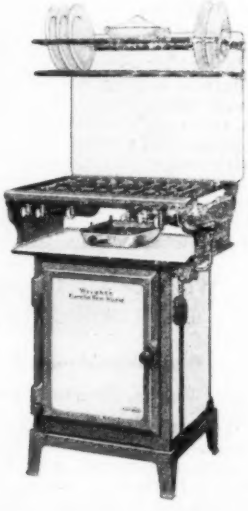
An example of this firm's gas-heated radiators is shown in the " St. Vincent " finished in black. For sink water heating there is Wright's new " Hotwell " fitted with ball valve. This is shown in mottled porcelain enamel finish, very easy to clean. The firm also show an example of their gas-heated circulators.



John Wright's "Sunhot" Water Heater.



John Wright's "Eureka New World" Gas Range.



John Wright's "Eureka New World" Cooker.

MISCELLANEOUS EXHIBITS AT THE FAIR - - -

Aerograph Company, Ltd.,

43, Holborn Viaduct, London, E.C.

The Aerograph Company, Ltd., show a complete range of their equipment. In addition to a comprehensive range of samples showing some of the beautiful finishes that may be obtained so quickly with the Aerograph spray gun, there is a complete working plant on the stand with which practical demonstrations are given. The Aerograph spray finishing system permits one operator to do as much work as five or six men with the brush, and also produces an infinitely superior finish free from unsightly brush marks and other blemishes. The paint is applied with such remarkable uniformity that in most cases it is found that two coats are equal in every respect to three coats applied with the brush.

The exhibit comprises two new light portable plants—the "Whippet" and the "Greyhound"—which bring the advantages of spray painting and finishing within the reach of all—squarely meeting to-day's demand for reliable and easily portable equipment suitable for a wide range of spraying operations of moderate size. In addition to the supply of spray painting and finishing equipment of all kinds, the Aerograph Company are also specialists in the design and installation of complete finishing plants, including conveyors, sand blast equipment, chemical cleaning apparatus, enamelling ovens, polishing equipment, and heating equipment. The firm have branch offices at Birmingham, Glasgow, Manchester, and Bristol, as well as in most of the principal cities of the world.

Anglo-American Oil Company, Ltd.,

36, Queen Anne's Gate, S.W. 1.

The exhibits of this Company are Pratt's High Test petrol, Pratt's Commercial petrol, and Pratt's Super Benzole Mixture. Of great interest are the remarkably fine models of the Company's huge refinery at Fawley, Hants, and the Pratt's depôt at Vauxhall, London. The size of the refinery illustrates how oil refining in Great Britain has developed in recent years. The support which the Anglo-American Oil Company gives to British industry is demonstrated by the fact that they employ over 10,000 British workpeople; they own 27 large ocean oil tankers—British-built and manned by British crews—22 British coasting vessels, 86 British-built barges and tugs, 1648 British-built railway tank cars, 694 British-built depôts, 2369 British-built lorries and tank wagons, and 706 British-built motor cars.

Ashwell & Nesbit, Ltd.,

Leicester.

This firm are demonstrating the "Runwell" rotary pump of the sliding vane type. Pumps of this description are simple of construction. The makers state that recent tests of this pump gave a volumetric efficiency at 5 ft. head of 100 p.ct., and a dry vacuum of 29 in. has frequently been attained.

Carron Company,

Carron, Falkirk.

On their stand the Carron Company devote some space to the display of their gas fires and cookers. The fires on view, which are in a variety of finishes, are in keeping with present-day practice. The inlet tap or gas injector can be adjusted for thorough control of gas and air, while the burner is so arranged that it is noiseless when lighted. Thorough ventilation is assured, the fires drawing the vitiated air from the room.

Specially interesting are the Carron cookers displayed. These are fitted with the "Carrontrol" automatic heat regulator, which regulates and maintains the temperature of the oven. Remarkable results have been achieved with Carron cookers fitted with this regulator, which has been subjected to exhaustive and prolonged tests. The cookers are further enhanced by their enamelled finish, making for easy cleaning and adding a bright note to the kitchen.

Chesterton Jones & Co., Ltd.,

David Works, Tyseley, Birmingham.

This firm are exhibiting a complete range of gas lighting fittings specially designed and manufactured to meet present-day requirements, small brass fittings, hot stampings, and last but not least the new "Regent" gas fire. The special feature regarding this is the device which lights the fire at a mere turn of the tap. These fires are shown in a variety of finishes and sizes, including several handsome models in lustre and enamel, finished with chromium-plated fittings.

Coventry Chain Company, Ltd.,

Spon End Works, Coventry.

This firm's central exhibit is a steel skeleton, on which are mounted various types of standard and stock chain drives, with roller and inverted tooth type chains; various types of conveying and elevating chains; various types of chain cases; and an application of the counterweight chain system. Some of these drives are motor-driven. There are in addition several large chain drives, illustrating the adaptability of chain-gearing.

The firm are exhibiting in conjunction with Messrs. Hans Renold, Ltd., of Manchester; and among other exhibits are the Coventry speed-reduction gear box, a Renold loom drive with slipping device, specimens of automatic chain tensioners, and a complete range of all patterns of Renold and Coventry chains.

William Cross & Son, Ltd.,

West Bromwich.

This firm are exhibiting a number of gas appliances, including "British" gas grillers, cookers, the "Otto" gas iron, a tailor's gas iron and stove, tinman's stove, "Columeta" gas radiator, portable gas fires, the "Moovezi" gas fire, and the "Panella" hotplate.

Crossley Bros., Ltd.,

Openshaw, Manchester.

This exhibit includes examples of vertical and horizontal type heavy (crude) oil engines—all shown in working operation. Type OVD 3 is a 3-cylinder vertical compressorless diesel engine direct coupled to a 50-KW. 220-volt D.C. dynamo, at 450 r.p.m., by the General Electric Company, and comprises a most economical generating set. The engine is representative of a range built in unit sizes having 2 to 6 cylinders up to 400-B.H.P. capacity. All the moving parts are supplied with forced lubrication—no hand oiling being required to any single part. The engine starts up instantly from cold direct on fuel oil by means of compressed air, used at starting only. The valve gear is overhead and driven by a chain working within a bath of lubricating oil. The fuel pumps are gear driven and grouped together in one compact, accessible unit attached at the governor end of engine. Although this engine is of the totally enclosed type, immediate access is afforded to all valves and fuel atomizers by sliding backwards a light aluminium cover plate, one movement of which completely exposes the cylinder heads and valve gear.

Expanded Metal Company, Ltd.,

Burwood House, Caxton Street, London, S.W. 1.

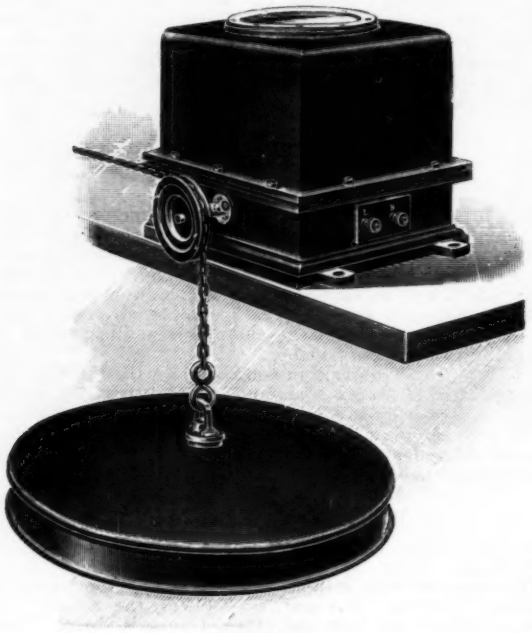
This exhibit consists of examples of the Company's products and models showing their uses; also photographs of various works carried out on its systems. Specimens are shown of "Expamet" expanded steel, which has been in successful and ever-increasing use all over the world for more than 35 years, as reinforcement for concrete in foundations, walls, floors, roofs, bridges, culverts, &c.; "RR" 6-in. mesh "Expamet" reinforcement for concrete roadways, pavings, &c.; "RR" and "Expamet" lathings for interior and exterior plasterwork; "Ribmet" for concrete and plaster work; "Exmet" reinforcement for brickwork,

concrete-block work, partition slabs, asphalt, &c.; mild-steel wall-ties for cavity walls; and " Expamet " expanded metal of various meshes and weights for openwork partitions, shop divisions, fencing, flooring, &c.

Gent & Co., Ltd.,

Leicester.

Among the apparatus shown on this stand is a transmitter, indicator, and recorder for showing the contents of a gasholder at a distance. [The firm recently fixed one of these instruments on the new waterless gasholder at Birmingham.] Another special exhibit is a new relay for controlling a circuit at a distance, suitable for operating from either A.C. or D.C. mains or battery circuit. When the armature is at rest, it closes certain circuits, but when attracted it closes other circuits, breaking the original circuit;



Transmitter.

the armature is locked by the armature of the coil release, and remains so until a current is sent through the release coil. One great advantage of this relay is that the operating coil cuts itself out of circuit after operating, so can be dealt with by small battery currents. It is, therefore, very useful for operating motor syrens for fire alarm purposes or from " high " and " low " liquid level contacts, " on " and " off " switches, and many other purposes.

Indicator.

A new pressure-gauge contact is also shown. This has an adjustable contact arrangement for " making " when pressure rises or falls, and so operates a sound signal or lamp, or other apparatus as required.

A wide range of " Pul-syn-etic " electric clocks is exhibited.

F. Gilman (B.S.T.) Ltd.,

Smethwick.

This firm are exhibiting for the first time a wide range of entirely new machines. The firm have in the past specialized almost entirely on boiler and economizer scaling tools for use on steam-raising plant. A new departure is being made this year, and a very wide range of flexible drive tools are now being manufactured. The type " M " set four-speed machine is a portable tool mounted on feet with casters for use anywhere in modern works. The motive power is provided by an electric motor which has a horizontal movement of 350° as well as a vertical movement, thus taking all strain off the flexible drive. Drive is by means of a rubber belt on four-step cone pulleys which gives four speeds, 850, 1750, 2375, 3000 r.p.m. Belt change is effected by two levers and occupies only a few seconds. The flexible drive is British made and runs in a steel-lined rubber covering.

" M " Type " Multi-flex " Set.

Type " C " set is a heavier machine embodying a 1½-H.P. motor, and is mainly used with sanding discs for removing steel bloom from metal work in general, and is also generally used for removing flaws and spills from tubes, &c. This set is suitable for heavy drilling, and for use with large grinding wheels up to 8-in. diameter. This is a fixed speed machine, 2800 r.p.m. Further similar machines of varying sizes are exhibited.

Gledhill-Brook Time Recorders, Ltd.,

Empire Works, Huddersfield.

One of the greatest assets in these days when lower production costs are a necessity is an efficient time checking and costing system. Punctuality is the foundation upon which to build a successful business; yet millions of pounds are lost annually through wasted minutes at starting and stopping times. Such wastage stifles business, eats into profits, and influences the worker, who becomes easy-going, or even careless. The best method of enforcing punctuality and increasing the efficiency of the worker without showing favouritism is by the installation of a reliable time checking system. Such a system is the Gledhill-Brook designed for use in either small offices or large works.

The Gledhill-Brook Time Recorder is reliable, accurate, and unfailing in its services; it quickly pays for itself out of the saving it ensures. The machine shows on a card the exact time of arrival and departure of every man, also the starting and finish of every job. It is accurate, impartial, and unerring; hence it is accepted by the workers who feel that they are getting a square deal. The employer also feels satisfied that he pays only for time worked. As an assurance against leakage it is worth the attention of all those who wish to purge their business of the deadening effect of lost time.

Many variations to suit different trade conditions are made by the manufacturers and are shown on their stand.

G. A. Harvey & Co. (London), Ltd.

Woolwich Road, Charlton, London, S.E.

Of outstanding notice on this stand is the extensive range of perforated metals. Messrs. Harvey have nearly sixty years' experience in the perforating of all materials. The firm possess an excellent plant for economical pro-

duction of sorting, grading, screening, and filtering plant. Those seeking information on ornamental perforated metal work, radiator covers, grilles, ventilator panels, and pipe guards will note the examples of craftsmanship displayed on this stand. Woven wire cloth of all meshes and gauges is produced by the firm. Steel filing cabinets, cupboards, tables, desks, shelving, storage bins, &c., are demonstrated.

Many kinds of industrial plant are undertaken complete at the firm's extensive works, the more important appertaining to the chemical and allied trades, comprising steel plate work up to 1½ in. thick, and bulk oil storage tanks up to 116 ft. in diameter.

Hunt & Mitton, Ltd.,

Birmingham.

A very interesting exhibit on the stand of this firm is an "F" type mechanical grease pump, which is built up in sections, locked together by a central securing rod. The grease is held in a large container fitted above the pump. This container and its spindle are double ended, so that when exhausted it is only necessary to remove the cover, re-charge the grease on top of the plunger, turn the container over, so that the grease is now underneath, and replace the cover.

The driving section (which can be arranged for either rotary or reciprocating drive as required, with various ratios of reduction for different speeds) operates both the plunger in the grease container and the feed pumps; the former is drawn slowly down, forcing the grease into the small apertures of the feed pumps, when it comes under the action of the pistons, and is so forced to its destination.

The rate of feed of grease can be adjusted by the number of discs fitted under the hexagon head of the pumps. The greater the number of discs, the less the supply, until with six discs there is no feed at all. At its greatest output each pump can deliver 0·14 c.c. of grease per stroke of the piston. A safety device is provided below the grease container, which permits of the mechanism driving the latter slipping, should the pressure in the container become too great. This prevents any damage to the apparatus if the delivery from the pumps is restricted or cut off entirely while the lubricator remains at work.

Any number of pump sections can be provided, from 1 to 8. Each pump section can feed two points—that is, a maximum of 16 points in all. If an odd number is required, one-half of a section can be cut out permanently by inserting six washers, as explained before.

The container holds about 2 litres of grease. When the container is empty a signal is given by the protrusion of a pin fitted just below same. This pin is provided with a terminal, so that a connection can be made if required to an electric battery or bell. All the working parts are made of steel, hardened and ground, and of the best workmanship. The design embodies high efficiency and extreme simplicity. Every part is standardized, and the novel method of assembly permits of considerable adaptability without upsetting the standardization of the various parts.

The component parts are of Swiss manufacture. but the lubricators are assembled, run in, and tested at the firm's works at Birmingham, and supplied bearing a full guarantee.

Leeds Fireclay Company, Ltd.,

Wortley, Leeds.

This "Kentmere" exhibit is designed to demonstrate the practical application of "Kentmere" insulating bricks, the efficiency of which is recognized, although the deposit of raw diatomaceous material is of recent discovery. It is worthy of note that "Kentmere" insulating bricks are made to a good size and shape, and are of high quality. They are stocked in sizes 9 in. by 4½ in. by 2½ in. and 9 in. by 4½ in. by 3 in. Special shapes are made to users' requirements.

John Rigby & Sons, Ltd.,

Salford, Manchester.

The exhibit of Messrs. John Rigby & Sons, Ltd., and associated firms, comprises a comprehensive display of wires, including pinion wire in brass, steel, phosphor bronze, aluminium, stainless, and other metals, also special tinned meter wires.

Staveley Coal and Iron Company, Ltd.,

Near Chesterfield.

On this stand is a representative range of cast-iron pipes, 1½ in. diameter to 72 in. diameter, with socket and spigot joints and with flanged joints. There are samples of Staveley sand-spun cast-iron pipe. These samples are cut in various ways to show the thickness and also the section. A spring on the stand is cut from a length of Staveley sand-spun pipe, and illustrates the density and elasticity of the material of the pipe as produced by the centrifugal action of the spinning process. Rings cut from sand-spun pipes show the concentricity of pipes made by this process. It is anticipated that Staveley sand-spun pipes will be available about June, 1931.

Fractures on view show the different grades of pig iron manufactured by the Company, while samples of various sizes of Staveley blast-furnace coke are on view, as well as tarred slag and wood wool.

A range of chemicals produced by the Company is exhibited.

Stewarts & Lloyds, Ltd.,

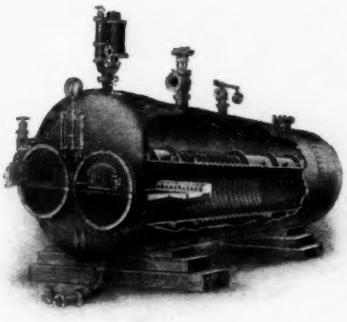
41, Oswald Street, Glasgow.

This firm are exhibiting steel tubes with Stewarts' inserted and welded joints, and also with Albion or Stewarts' loose flange joints for mains and distribution pipes. For service pipes attention may be directed to the samples of screwed and socketed tubes, painted and galvanized, ranging from ¼-in. to 6-in. bore, and to the complete sets of standard fittings. There is also a special set of genuine puddled wrought-iron tubes made to the specification of the Institution of Gas Engineers, together with samples of strip, marked I.G.E., from which these tubes are made. Further exhibits include models of self-supporting steel chimneys, model slag ladle and carriage complete with tipping gear, samples of special quality iron castings to resist heat, &c., samples of structural steel work, and of electrically welded light steel tube. A large range of tubes, specials, cocks, flanges, valves, &c., is also in evidence.

John Thompson (Wolverhampton). Ltd.,

Wolverhampton.

This firm are exhibiting a "John Thompson" dish-ended Lancashire boiler, 30 ft. long by 9 ft. 3 in. diameter, complete with "Thompson" steam fittings, in position, suitable for a working pressure of 200 lbs. per sq. in. These boilers can be built for any working pressure, up to and including 250 lbs. per sq. in., being the most modern con-



struction, with corrugated flues throughout. It is stated that over 4000 of these boilers have been built since 1908. This firm are also manufacturers of water-tube, "Cornish," "Economic," and "vertical" type boilers, superheaters and pipework, steel and brick chimneys, and complete boilerhouse plants.

Tilghman's Patent Sand Blast Company, Ltd.,

Broadheath, near Manchester.

This firm have on view, in addition to several air compressors, a 7 ft. diameter rotary table sand-blast machine, designed for operating at 80 lbs. pressure. This type of plant is designed for cleaning flat castings such as stove or grate parts, prior to vitreous enamelling. The table and apparatus embody several recent patents relating to the method by which the jets are traversed across the table, in such a manner that the table is evenly covered over its whole surface. The sand blast apparatus also has a special feature in a device that definitely separates the abrasive and dust, thus considerably increasing the cutting properties of the former.

The firm are also exhibiting a sand-blast tumbling barrel with apparatus fitted with two nozzles; this is of a new totally enclosed, dust-proof design, necessitating no pits or excavations, as the whole of the plant is arranged to stand on the floor level. A further interesting exhibit is a new dust arrester, provided with rigid cloth screens which are easily removable.

To Whom Credit is Due for the Gas Section

National Committee.

This Section is organized under the auspices of a National Committee, fully representative of the various organizations in the Industry. The members of this National Committee are as follows:

Chairman: Mr. Frank West, M.I.Mech.E.

Vice-Chairman: Mr. A. W. Smith.

Representing the—

Society of British Gas Industries	Mr. Charles S. Bennett Mr. G. Clark Mr. Cyril G. Davis Mr. D. M. Gibb Mr. A. W. Glover Mr. F. J. Gould Mr. R. B. Hodgson Mr. R. J. Milbourne Dr. E. W. Smith Mr. J. Winson Scott Mr. F. C. Tilley Mr. A. L. Griffith
National Gas Council	Mr. W. J. Sandeman Mr. L. E. Clift
Institution of Gas Engineers	Mr. Harold E. Copp Mr. C. S. Shapley Mr. W. E. Price
British Commercial Gas Association	Sir Francis Goodenough, C.B.E. Mr. Hubert Pooley

Hon. Secretary: Mr. R. J. Rogers.

Local Organizing Committee.

A Local Organizing Committee to co-operate with Exhibitors in the Section has also been formed, consisting of the following members:

Mr. Frank West	The Derbyshire Silica Fire Brick Company, Ltd., Friden, near Buxton.
Mr. R. J. Milbourne	Messrs. C. & W. Walker, Ltd., Donnington, near Wellington, Shropshire.
Mr. A. W. Smith	General Manager and Secretary, Gas Department, Birmingham.
Mr. R. B. Hodgson	The Whessoe Foundry and Engineering Company, Ltd., Darlington.
Mr. C. S. Bennett	Messrs. Gibbons Bros., Ltd., Dudley.
Mr. Geo. Clark	The Bryan Donkin Company, Ltd., Chesterfield.
Mr. Cyril G. Davis	The Davis Gas Stove Company, Ltd., 60, Oxford Street, London, W. 1.
Mr. D. M. Gibb	The Parkinson Stove Company, Stechford, Birmingham.
Mr. F. J. Gould	24, Thornsett Road, Earlsfield, London, S.W. 18.
Mr. H. Pooley	Engineer and Manager, Gas Department, Leicester.
Dr. E. W. Smith	The Woodall-Duckham Companies, Allington House, Victoria Street, London, S.W. 1.
Mr. J. F. Davies	Messrs. John Wright & Co., Essex Works, Aston, Birmingham.
Mr. R. Talbot Clayton	Messrs. Cannon Iron Foundries, Ltd., Deepfields, near Bilston.
Mr. J. Belliss	President (Birmingham Chamber of Commerce, 95, New Street, Birmingham).
Mr. C. Holland Harper	Chairman (Fair Management Committee, British Industries Fair, Chamber of Commerce, Birmingham).
Mr. C. Elliott	General Manager (British Industries Fair, Chamber of Commerce, New Street, Birmingham).
Mr. H. Eyles	Secretary (Birmingham Chamber of Commerce, 95, New Street, Birmingham).
Mr. R. J. Rogers	Hon. Secretary (Gas Industries Section, Gas Department, Birmingham).

Notes from the Fair

The Gas Industries Section again occupies a prominent position at Castle Bromwich, and covers an area of 41,000 sq. ft. There are over 70 exhibitors in this section, and they have adopted a uniform colour scheme of green and yellow, which gives the section the appearance of a Fair within a Fair.

* * *

Business men from all parts of the world are pouring into the Midland Mecca, to view the best of Britain's products. But these visitors cannot live by gazing at Britain's shop window alone; they must be fed. During the fortnight the Fair is open thousands of meals will be served, and nearly all the kitchens are using gas for cooking.

* * *

A Fair official declared that the proper overhead illumination of Castle Bromwich, since the Fair takes place during the winter months, is of supreme importance. Nearly all the Fair is illuminated again this year by high-pressure gas lamps.

* * *

Every day during the run of the Fair various trade organizations will be meeting in the Conference Hall, and gas fires will keep the delegates warm, not only in the Hall but in the dining rooms and in many other positions throughout the Fair.

* * *

An information bureau has been provided in the Gas Industries Section of the Fair by the British Commercial Gas Association and members of the Society of British Gas Industries. The Bureau, covering an area 20 ft. by 56 ft., is divided into a central hall and four rooms, where experts are helping visitors with industrial or domestic problems.

On the walls of the central hall are four plaques showing some of the chief activities of the gas industry. Opposite the fireplace there is "The Ship of Adventure," symbolizing the youthful and progressive spirit of the British Gas Industry.

Externally the bureau is modern in design, without any mouldings, reliance being placed on the general proportions and good materials and colour. The external walls are constructed of polished aluminium Plymax, decorated by bands of bright colour.

A feature of the outside of the bureau is a series of twelve oil paintings, brightly illuminated by gas burners. These paintings illustrate the numerous uses for gas in the factory for motor-car manufacture, printing, heat treatment, biscuit baking, &c.; for lighting, heating, cooking and refrigerating in the home; and the use of its bye-products—coke, dyestuffs, chemicals, fertilizers, and fuels.

The bureau was built to the designs of Mr. H. Austen Hall, F.R.I.B.A., Consulting Architect to the B.C.G.A.

* * *

While immense extensions were continually being made to the series of buildings now thrown into a single hall one-third of a mile long, there were practical difficulties in bringing the various industries and allied trades together; the task, arduous as it has been, is justified by the success attending its accomplishment.

Home and overseas buyers have for the first time grouped and arrayed before them, in effective and composite manner, the respective classifications of goods which are of primary interest to them, with a choice of entrances if they should wish to proceed direct to a particular area of the Fair.

ADDRESS TO THE - - JUNIOR ASSOCIATIONS

The President of the Institution of Gas Engineers, Mr. H. E. Copp, gives an inspiring message to the Juniors of the Gas Industry at a Joint Meeting of the Junior Gas Associations held at the British Industries Fair, Birmingham, to-day

The only criterion of competency to address a gathering of the representatives of Junior Associations is that of ability to keep one's mind abreast of the times; that in itself is a difficult mental accomplishment to one who has been so long engaged in devoting his energies to the welfare of the Gas Industry, as I have been.

It is, therefore, with a great sense of responsibility that I have undertaken the task which lies before me to-day.

In the members of the Junior Associations the potentialities of the Industry repose, and upon this I would lay great emphasis. To-day you have greater facilities than ever for the acquisition of the latest and most advanced scientific knowledge. In addition you have the benefit of the past experience of the Industry. It is for these reasons that we look to you to apply successfully such knowledge by the introduction of new ideas, for the opportunity of so doing is before you. You have all the advantages of the accumulated knowledge of those who have preceded you—their successes and their failures—so I exhort you to set to work and study hard so as to equip yourself for future accomplisments in the best interests of the calling you have chosen. It is surely a calling worthy of the best ideals of our country, and is, in reality, the responsibility of utilizing to the best advantage the great resources with which the nation has been endowed by nature. That in itself should be a great inspiration, for with what greater aim, from a mundane point of view, could a young man set out on a life of usefulness?

Some few countries have the natural advantage of possessing water power, available from high altitudes, which is capable of being transformed into heat and power, but in this country we are dependent upon lavish gifts of nature in the form of coal. Let us se that we make the fullest use of our responsibilities in the use of such gifts.

An Unequalled Accomplishment.

The Gas Industry may justly pride itself upon the fact that as the result of the assiduous work of those engaged in it, and of scientific research, it is now in a position to return some 85 p.ct. of the heat energy contained in coal in the form of gas, coke, fuel oils, and other products—a scientific and unequalled accomplishment which must be regarded as a service of the highest order to the country.

Let us not be discouraged by the success of our competitor, the electrical industry—all honour to those engaged in that industry for their great achievements—but it is incumbent upon all of us who serve the Gas Industry to proclaim on every occasion that we represent an Industry by no means effete or decadent. The electrical industry is at present enjoying a period of artificially created popularity which has been fostered by all political parties, and exploited by apparently unlimited finance and widespread advertising—a state of affairs which I submit can reflect but a passing phase of public opinion. The Gas Industry deserves well of the nation, and we all know that had it not been for its services during the war, the destinies of the nation would have been very different; furthermore, the "man in the street" has little idea of how much he owes to the scientific carbonization of coal for the amenities of life which he enjoys. We do our work and serve the community without polluting the atmosphere with smoke, noxious sulphurous fumes, or grit.

A modern gas-works does not emit smoke, but the day has yet to come when the electricity generating station can claim a similar virtue.

The Gas Industry will continue with its present policy of adhering strictly to the truth and not overstating its claims. We have quite enough to do in advocating the greater uses of gas which may be advantageously employed to the benefit of the community.

Improving Our Education.

An effective way of meeting the competition with which the Gas Industry is faced, is by improving our education so that we may not only become more effective technically but as salesmen. Nowadays we hear so much about education that I can imagine the younger members may possibly become nauseated by the mere mention of it; but I want to suggest that the term should be interpreted in a wider sense than that of scholastic study, and that we should regard it as the art of acquiring knowledge which enables us to face the difficulties of life with confidence and equanimity.

It is a very true aphorism that "knowledge is power," and, from the point of view of a salesman, it is essential that he should believe in the truth of his cause, and possess the necessary knowledge for its advocacy.

The Institution of Gas Engineers have placed the whole Industry under a debt of gratitude for the establishment of a general scheme of education for those engaged in it on the manufacturing, engineering, and distribution sides. Education not only enhances the prestige of everyone concerned, but, what is more important, it is a means of assuring that the destinies of the Industry will only be entrusted to those possessing the necessary technical knowledge to guide it into paths leading to greater advancement.

It has been said, perhaps not without a suggestion of Pharisaism, that "there is always room at the top." In a measure, this is true, but we have to remember that it has to be made quite sure that the man at the top is the right one. This can only be done by eliminating all those who do not possess the necessary technical and psychological qualifications for positions of responsibility. This can be done by education, observation, and a correct evaluation of administrative qualifications.

I have, on previous occasions, defined education as a necessary means of acquiring powers of observation and the science of applying such powers to practical uses. From observation in true perspective we are able to exercise our faculties of deduction, so that when we possess such accomplishments we may lay claim to have acquired some measure of education. It cannot be given to every one to become the head of a great undertaking. Such positions are necessarily limited in number, and they may tend to grow fewer as the smaller gas-works are gradually absorbed by the larger ones. Such a trend of events is inevitable, but it is satisfactory to think that it does not prevent young men of a suitable type choosing the profession of gas engineering as a career.

Vacancies for Many.

There may not be room at the top for all, but there are vacancies for many as expert carbonizers, chemists, tar-works and distribution superintendents and salesmen, and yet relatively few seem to have chosen these particular branches of the Industry as their special sphere of activity. Surely none is lacking in interest or scope. Our ideas of the efficient distribution of gas have been greatly developed in recent years, and are likely to become of increasing importance in the future. I do not suggest that we shall have to distribute gas from gas-works situated in coalfields or oil bearing areas as is necessary in Germany or the United States respectively, where geographical and geological conditions are so different; but I do submit that high-pressure distribution over relatively large areas through steel mains from central gas-works is bound to come in this country, and we must have more men with the necessary technical knowledge to deal with the problems involved. The distribution of gas is a more logical way of delivering energy to the consumer than by means of electric cables; moreover, it is a more economical method when we remember that 1 c.ft. of gas may contain anything from 400 to 500 B.Th.U., whereas a B.o.T. unit of electricity only contains 3412 B.Th.U.

Salesmanship.

Salesmanship is greatly needed in the Gas Industry, and we are fortunate in having within our ranks Sir Francis Goodenough, the chief exponent of the science of salesmanship in the country. Efficiency and scientific attainment in the manufacture of gas must be coupled with salesmanship of the highest order. We must tell the public of all the advantages which may be obtained by using gas for domestic and manufacturing purposes. We have not sufficiently advocated the advantages of gas for lighting, while few of our consumers know that gas lighting can be con-

trolled by switches. More must be undertaken by gas authorities in the maintenance of consumers' apparatus. Gas is rendered unpopular because burners and gas fires are found to be in a lamentable state of neglect and inefficiency, simply because consumers have not had the enterprise to notify the gas undertaking or have concluded that this state of affairs is inherent in the use of gas. This impression must be removed.

Now I am sure that your first criticism of my remarks will be this: If we cannot all become administrative gas engineers, what position and what remuneration have we in view? My answer is that a prosperous gas undertaking can and undoubtedly will offer to all their responsible officials an adequate salary and an attractive position in life to all who contribute with loyalty and enthusiasm to its success. The administrators of our most progressive gas undertakings are certainly sufficiently astute to retain the services of those who have proved their value, and it is an obvious corollary that others will follow when it becomes evident that it is justified in the interests of the undertaking. Little can be done for the improvement of the status of those engaged in the Industry excepting in some such logical sequence.

As you will be aware, the Institution of Gas Engineers regards the interests of the members of the Junior Associations as of the highest importance. A very large proportion of the matters which come before the Council for consideration have a very direct bearing upon the welfare of members of these Associations. You may remember that the Bronze Medal of the Institution is awarded to the author of the paper which shall be adjudicated as the best presented before a Junior Association during each year By such means the Institution hopes to encourage young men to cultivate original thought and also to give expression to such thought in the interests of the future development of the Gas Industry.

New Avenues for Research.

The programme of the numerous Research Committees of the Institution suggests that many subjects might engage the attention of the younger men with suitable qualifications, and a careful study of the present position will disclose new avenues for profitable research.

Courses of lectures are now in progress at Leeds University, which are of importance to those engaged in the Gas Industry. I would strongly recommend all who are within reach of Leeds to make a special effort to attend them. These lectures are being delivered by men of eminence and authority, and must necessarily prove to be of great value to anyone who is able to attend them, whether he be a Junior or a Senior.

In the British Industries Fair we see ample evidence of the progress of science as applied to Industry in an infinite variety of ways. The first thought which occurred to me was whether we, as representatives of the Gas Industry, are making as much use of the general trend of scientific development as many other industries are apparently doing. After careful thought, and with what I may describe as a somewhat intimate knowledge of the work which is being carried on, I venture to think that we are.

GAS SERVICE - - -

Discussed from the viewpoint of the Gas Salesman

Convenience Before Efficiency.

Absolute indifference to efficiency is one of the first facts which has impressed itself upon Mr. A. Forshaw, M.Sc. (of R. & A. Main, Ltd.) in his dealings with the woman consumer and those who come most into contact with her. Mr. Forshaw recently gave an interesting address to the Midlands District Circle on "Gas from a Woman's Point of View"—at second hand, as he styled it, because he was deputizing for Miss E. M. Gompertz, who was unfortunately prevented by illness from attending. If you can convey the idea of thermal efficiency to the consumer, he said, she will appreciate it. But he thinks it is a poor hope, and in any case she will rank it far below convenience. This is a point always worth bearing in mind by the salesman. Another fact which has impressed him is that the ordinary woman has very little idea of size, and great care must be exercised when she is choosing a cooker in a large showroom for her small scullery. Moreover, "to cook for six" may mean a good many things. The six may sit together at one table, or they may be divided between dining room, nursery, and kitchen, with a separate menu for each.

Mr. Forshaw's paper was chiefly concerned with cookers, as they are naturally the most important appliance from a woman's point of view. But his mention of only two other appliances is noteworthy. "I find two of the smaller appliances greatly appreciated. These are distant switches and gas pokers. The appreciation would be much greater in volume if more women knew of these things, more particularly the poker. Its usefulness in reducing hard and dirty work is unbelievable until it is tried. . . . With regard to switches, I find that over 90 p.ct. of ordinary people have never heard of them."

A full report will appear in the February "Gas Salesman."

Complainants Classified.

A reduction of complaints from 7192 in 1926 to under 4500 in the current year is the record of the Macclesfield Corporation Gas Department, with an increase in consumers from 10,079 to 10,602. Mr. F. C. Randall, their Distribution Superintendent, who recently addressed the Lancashire District Circle, has long since realized that complaints are, up to a point, a real joy to the salesman, and he has rather "specialized" in them. He even classifies his malcontents under three main headings. Consumer A reports a complaint in such manner as to demand prompt attention. He is easy. He gets it and is satisfied. Consumer B is not quite so simple. He waits till an inspector calls, and then makes a casual complaint. The trouble to guard against here is that a casual complaint is liable to be dealt with casually. Result, a second complaint. Even this can be turned to advantage. On such occasions, when they occur at Macclesfield, a member of the Sales Staff accompanies the fitter on his next visit. The fitter receives his due, whatever it may be. An apology to the consumer renews confidence. The salesman himself encounters problems which he would otherwise not have met, and benefits accordingly. Consumer C is the most difficult problem. He uses gas appliances and notes they are not functioning as well as before. But he sits and does nothing until matters become absolutely desperate. The trouble is that somebody else may come along while he is sitting, and offer something supposed to be the acme of perfection for its own particular job. Mr. C may find he has gone from bad to worse, but, having bought his horse, he quite likely decides to ride it. The only remedy Mr. Randall can suggest is to *invite* complaints, on gas accounts or by other means, and, of course, a maintenance scheme giving each consumer at least one annual visit.

One District One "Gas Man."

Those who read the animated discussion on Mr. Randall's paper in the "Gas Salesman" will be interested in a suggestion put forward by Mr. J. B. Stewart, of Rochdale. So often a complaint leads to a succession of visits by various officials. One calls to see what is wrong, and sends another to correct a service fault. The service man finds something wrong with the meter, and so on, until the consumer, who does not understand it all, writes: "We have had four men on the job; please send someone this time who will do it properly." Could we not, asked Mr. Stewart, arrange districts in such a way that each could have one man, who could cover the whole of it once every three months, and carry out the duties of meter reader, slot collector, gas fitter, and, in fact, general gas factotum. An ideal, perhaps, but think of the advantages of the personal touch and the personal attention, which count for so much.

Another good point in the discussion was a certain difference of opinion on the question of *asking* for complaints. Of course, as Mr. Randall pointed out, the consumer who "suffers in silence," from laziness, ignorance, or any other motive, is a problem, but others maintained that there can be a stage of almost "pestering" people for complaints, till in the end they come to think you have no confidence in your wares, and are actually expecting dissatisfaction. After all, it is really a question of means and discretion, but it is a point worth remembering.

IN CONTINENTAL COUNTRIES - - -

Abstract Translations from the Technical Press of France and Germany

THE APPLICATION OF WASH BOTTLES WITH SINTERED-GLASS DIAPHRAGMS IN GAS ANALYSIS.

The use of wash bottles provided with sealed in sintered-glass diaphragms is described by H. Brückner in "Das Gas- und Wasserfach," 1931, 74, 121-2 (Feb. 7). These may with great advantage replace the usual type of Drechsel bottles since, owing to the fine subdivision of the gas, the rate of passage of the gas may be increased many times compared with the rate permissible with a Drechsel bottle. The time required for a test is thereby considerably shortened, and increased accuracy is obtainable since a larger volume of gas may be tested.

The diaphragms are made in four different grades of porosity, and three different patterns of bottles, applicable respectively to gas flows of 5, 10, and 50 c.ft. per hour, are available, compared with 2 c.ft. per hour for a Drechsel bottle. In the case of the largest size, the back pressure is 8-10 in. of water; hence the gas must either be forced through by use of a small laboratory blower or sucked through by use of a filter pump.

With use of an ordinary Drechsel bottle and a gas flow of 1 c.ft. per hour, the ammonia content of town gas was found to be 0·135 and 0·140 grain/100 c.ft. in duplicate tests. A test with the largest size sintered-glass diaphragm bottle gave the following results at different rates of gas flow, 50 c.c. of $\frac{N}{10}$ H_2SO_4 being contained in the bottle.

Rate of gas flow, c.ft. per hour	3·5	17·5	35	52·5
Volume of gas passed, c.ft.	17·5	17·5	17·5	35
Duration, hours	5	1	0·5	0·67
Mean NH_3 content found, grains /100 c.ft.	0·140	0·135	0·140	0·140

In the case of crude gas, a gas velocity of 52 c.ft. per hour may also be employed if the bottle is charged with 50 c.c. of $\frac{N}{1}$ H_2SO_4. A bottle of this type enabled the ammonia content of the gas to be determined very rapidly in each of the sections of an ammonia scrubber.

Another application is in the estimation of the sulphuretted hydrogen content of gas with iodine. In this case, a second bottle charged with standard sodium thiosulphate solution is employed to trap any traces of iodine carried forward from the first bottle.

With these bottles, pulsations causing pressure variations in the flow meters used to measure the gas are not obtained, though such pulsations are very marked in the case of ordinary wash bottles.

National Gas Council

Meeting of Central Executive Board

A meeting of the Central Executive Board of the National Gas Council was held at 28, Grosvenor Gardens, S.W., on Tuesday, Feb. 10—Sir DAVID MILNE-WATSON, LL.D., D.L., in the Chair.

GAS LEGISLATION.

A further letter was reported from Sir David Milne-Watson to the President of the Board of Trade, urging on behalf of the National Gas Council that the proposed Committee to give effect to the recommendations contained in the 2nd Report of the National Fuel and Power Committee should be appointed forthwith and should be invited to submit their report at the earliest possible moment, and that legislative effect should be given with equal dispatch to the recommendations made therein.

GOVERNMENT SUPPORT OF ELECTRICITY.

The activities of the Minister of Transport (Mr. Herbert Morrison) in attending meetings throughout the country for the purpose of "boosting" electricity in detriment to gas were severely criticized, and the necessary steps were decided upon to combat this biassed Government propaganda.

SOUTH YORKSHIRE GAS NETWORK BILL, 1930.

It was reported that 26 Petitions had been lodged against this Bill, of which 15 had been deposited by Gas Undertakings.

LOCAL GOVERNMENT ACT, 1929.

The position of statutory gas undertakers in cases of an alteration of boundaries of local districts was discussed, and it was stated that the matter had been considered by the Conjoint Conference of Public Utility Associations, who had consulted the officials of the Ministry of Health on the point. The Ministry had agreed to insert in every Order made by them in connection with a review of local districts, a protective clause providing that nothing in the Order should alter the area of supply of any statutory public utility undertaking or prejudice or affect the existing powers or charges of any such company, body or person under their Acts or Orders.

TWENTY-TON WAGONS.

It was reported that, in accordance with the decision of the Board at their previous meeting, a letter had been addressed by the Council to the Railway Companies, with the exception of the Great Western Railway Company, asking whether they would be prepared to grant a rebate where 20-ton wagons were employed, particularly if coal were taken in such wagons in regular train-loads from the same mining districts.

A separate letter had been addressed to the Great Western Railway Company, urging that their policy of granting rebates where 20-ton wagons were used should be further extended in cases where coal was conveyed in train-loads from the same mining district.

DE-RATING.

It was reported that a letter had been addressed by the Council to the President of the Board of Trade, urging on behalf of the Gas Industry that their claim for a rebate on the rates payable in respect of gas undertakings should again be considered by the Government.

CONJOINT CONFERENCE OF PUBLIC UTILITY ASSOCIATIONS.

The draft constitution which had been approved by the Executive Committee of the Conjoint Conference and by the full Conjoint Conference itself was unanimously adopted by the Board.

FEDERATION OF BRITISH INDUSTRIES—GRAND COUNCIL.

Mr. H. C. Smith, M.Inst.C.E., of the Tottenham and District Gas Company, was appointed to take the place of Mr. F. J. Bradfield (resigned) on Main Group 14, Sub-Group 3, Public Utilities, of the Grand Council of the Federation of British Industries.

THE "JOURNAL" TECHNICAL RECORD

Which also contains Full Reports of Meetings of Gas and Allied Associations ———

Manchester and District Junior Gas Association

Visit to the Chemical and Metallurgical Corporation, Ltd., Runcorn.

Over a hundred members of the Association were present at this visit on Feb. 7, under the Presidency of Mr. C. H. Bamber, B.Sc., of Bolton. Mr. Arnatt, Managing Director of the firm, and Messrs. J. W. Crabtree, S. B. Casson, D. W. Beesley, Dr. Bott, and Mr. Riley, and several members of the Technical Staff received the members and officiated as guides around the extensive chemical works.

The chief products of the works are sulphuric acid, hydrochloric acid, and various dipping acids, Glauber's salt, zinc, chloride, red lead, litharge, ammonia, and ammonium sulphate.

Sulphuric Acid Plant.—The method of manufacture of sulphuric acid is entirely by the contact process, the sulphur dioxide being obtained by the roasting of concentrated pyrites (non-cuprous iron pyrites containing 47 p.ct. of sulphur).

There are three Humboldt pyrites furnaces, each with seven hearths, and three Huntingdon-Heberlein furnaces, each with twelve hearths. The mechanical capacity of each furnace is about 24 tons of pyrites per 24 hours on bottom gear, 35 tons on second gear, and 60 tons on top gear. The gases leave at 500° C. There are four electrostatic dust precipitators (two spare) each housed in brickwork, one ton of dust being removed every 24 hours. The voltage employed here is 50,000.

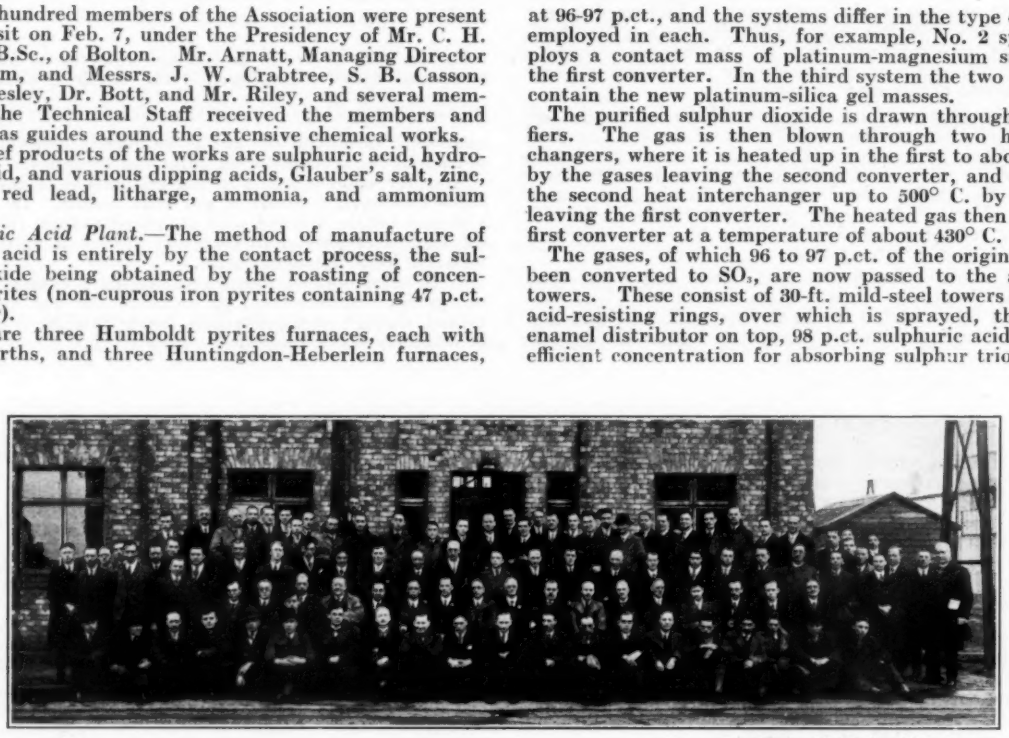
The dust-free gases leave at 350° C. and pass through a water-cooled neck into the "Glover Tower" filled with acid-resisting packing and sprayed from the top with cold 40 p.ct. sulphuric acid, which removes the bulk of the arsenic contained in the gases and part of the chlorine. A second wash tower using 10° Tw. acid removes the remaining chlorine. The gas passes through twenty 6-in. lead tubes with electrodes in each. The voltage employed here is 30,000. From this point, further purification consists in passing the gas coke filters and the final alkaline wash tower using pure water. The purified gas is then freed from water vapour by passing through the "weak" and "strong" drying towers successively using sulphuric acid of 140° Tw. and 168° Tw. for the purpose.

The Converter System.—The contact plants, of which there are three, are based on the Grillo system, with the difference that there have been elaborated a number of improvements on the original design, especially in the method of heat exchanging of entering and exit gases, with the object of obtaining as complete a recovery of heat as possible, of avoiding condensation of acid in the system, and of attaining a correct distribution of heat in the converter.

Each of the three systems employs two catalyst chambers, the first working at 75 p.ct. conversion and the second at 96-97 p.ct., and the systems differ in the type of catalyst employed in each. Thus, for example, No. 2 system employs a contact mass of platinum-magnesium sulphate in the first converter. In the third system the two converters contain the new platinum-silica gel masses.

The purified sulphur dioxide is drawn through the purifiers. The gas is then blown through two heat interchangers, where it is heated up in the first to about 300° C. by the gases leaving the second converter, and further in the second heat interchanger up to 500° C. by the gases leaving the first converter. The heated gas then enters the first converter at a temperature of about 430° C.

The gases, of which 96 to 97 p.ct. of the original SO_2 has been converted to SO_3, are now passed to the absorption towers. These consist of 30-ft. mild-steel towers filled with acid-resisting rings, over which is sprayed, through an enamel distributor on top, 98 p.ct. sulphuric acid, the most efficient concentration for absorbing sulphur trioxide.



[*Photo. by Birtles, Warrington.*

PHOTOGRAPH TAKEN AT THE CHEMICAL AND METALLURGICAL CORPORATION WORKS AT ASTMOOR, NEAR RUNCORN, ON THE OCCASION OF A VISIT BY THE MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

The largest building in the works is the hydrochloric acid and salt cake plant, comprising nine coke-fired furnaces.

At the conclusion of the inspection of the works, the party adjourned for high tea, which was served in the works canteen. Mr. ARNATT presided, and offered a hearty welcome to the visitors.

Mr. APPLEBEE, F.C.S., A.I.C. (Manchester), moved, and Mr. J. ALBINSON, B.Sc. (Partington), seconded, a vote of thanks to the firm for their kindness in inviting the Association to visit their model chemical works.

Mr. ARNATT, Mr. BEESLEY, and Mr. CRABTREE replied on behalf of the firm.

The PRESIDENT then called upon Mr. G. C. Riley to read a paper prepared by him jointly with Dr. Bott.

THE WORLD POSITION OF NITROGEN.

By G. C. RILEY, M.A., B.Sc., and H. G. BOTT, Ph.D., A.I.C.

[EXTRACT.]

The increased demand for ammonia for agriculture, for the Solway ammonia-soda process, and other purposes, converted gas liquor from a source of trouble into a valuable bye-product, just as the demand for coal-tar products did for its companion, coal-tar. Thus, by one of the strange coincidences which so often take place, the unlocking of this great source of combined nitrogen deposited in the carboniferous period coincided with the new and increasing demands for the product. With the rapid development of the Gas Industry, large quantities of nitrogen products

were available. In 1880 ammonium sulphate became available also from bye-product coke ovens.

The approximate production in 1880 was 250,000 tons as ammonium sulphate; in 1890, 400,000 tons; and in 1900, 500,000 tons.

No difficulty was found in absorbing these quantities in agriculture and industry, and it became a matter of concern that the available supplies of nitrogenous materials were likely to become inadequate to produce the foodstuffs necessary for the growing population.

Sir William Crookes, in his Presidential address to the British Association at Bristol in 1898, gave a detailed survey of the position of the available wheat crops of the world, together with an estimate of the uncultivated land still available for wheat production, and of the annual increase of population of the world. Taking the average production of wheat over the years 1871-1896 at 12·7 bushels per acre, he predicted that by the year 1931 all the available wheat lands would be required to supply the world's needs, and after that there would be an increasing wheat shortage. There would thus be required increasing amounts of artificial fertilizers, and he reviewed the well-known sources of fixed nitrogen, guano, ammonia from gas-works, and Chile nitrate. He pointed out that our only hope was to harness the unlimited supply of nitrogen in the atmosphere, and confidently predicted that " before we are in the grip of actual dearth, the chemist will step in and postpone the day of famine." He himself at the Royal Society in 1892 had demonstrated the " Flame of burning Nitrogen," and Lord Rayleigh in 1897 had succeeded in effecting the union of 29·4 grammes of nitrogen and oxygen with the expenditure of one horse-power of electrical energy.

The Accomplished Fact.

Dr. R. E. Slade in his paper on " The Nitrogen Industry and Our Food Supply," which very appropriately was read to the British Association, again at Bristol, in September, 1930, reviewed Sir William Crookes' predictions in the light of accomplished fact. The anticipated difficulty has been overcome up to the present. In the first place, the area of land producing wheat is actually about 20 p.ct. greater than Crookes' estimate, as the result of improvement in agriculture and machinery methods. Secondly, the yield per acre is definitely above his average figure, although it has not exceeded 13·5 bushels per acre. This has been made possible by the increasing use of fertilizers available through their synthetic production; but the increased yield by their use in some countries has been offset by other cases where intensive cultivation has made it profitable to work with smaller yields. The world production of wheat has reached the figure of 4400 million bushels, about 30 p.ct. more than Crookes estimated we should require.

The developments in this century have been mainly concerned with the synthetic production of nitrogen compounds from the air.

The Researches of Haber.

The greatest step forward has resulted from the researches of Haber on the production of ammonia from nitrogen and hydrogen. Haber and his pupils were working on this subject from about 1905, and the Badische Company took up the process in 1910. With the collaboration of Dr. Bosch it was rapidly developed on the commercial scale, 30,000 tons of ammonium sulphate being produced in 1913. The process consists in circulating a mixture of pure nitrogen and hydrogen at a pressure of 150 to 200 atmospheres, over a special iron catalyst at about 600° C. About 8 p.ct. volume of ammonia is formed at equilibrium, and this is washed out and the gases recirculated. Special technique had to be devised for working on a commercial scale with such pressures. The Badische Company obtained the hydrogen from water-gas, which was subsequently treated by the Bosch process with steam and ferric oxide catalyst to convert the carbon monoxide into carbon dioxide and hydrogen. Owing to the war demands, the Leuna works was also erected, producing the mixed gases by treating a mixture of producer gas and water gas by the Bosch process. In 1918 the combined production of nitrogen compounds by these two was equivalent to about 900,000 tons of ammonium sulphate.

The fixation of nitrogen by this process has proved so much cheaper than by the arc or cyanamide process, that its development has quite outstripped the others. The production of nitric acid by oxidation of synthetic ammonia over platinum, introduced as a war measure, has become of increasing importance since 1922 in comparison with other sources of nitric acid. An American process has proved to be of so much lower installation cost and more efficient in operation than the processes in Europe that it has revolutionized the nitric acid industry of that country, and the process is now being licensed for use in Europe.

After the war the production of synthetic ammonia, in Germany especially, continued to increase rapidly, and it was largely due to this increase that in about 1925 the world production of synthetic nitrogen equalled that of Chile nitrate and bye-product ammonium sulphate combined, and since then it has left them quite out of the running, and we seem to be approaching, if we have not yet reached, a position of over-production. The world nitrogen consumption for the fertilizer year 1929-1930, which is of the order of 2½ million tons, has only increased by 4½ p.ct., compared with increases of 14 p.ct. for 1928-1929 and 25 p.ct. for 1927-1928. This may indicate an approach to the saturation point of the world nitrogen market, or it may be due to the economic position of the farmers who have curtailed their expenditure generally.

The I.C.I. factory at Billingham, which started operation in 1923, in 1927 was manufacturing 19,000 tons of fixed nitrogen per annum, and for 1931 its production is estimated at 150,000 tons. The German I.G. is producing about 500,000 tons per annum, and projecting an extension of 250,000 tons per annum. In America, an estimate for 1930 is about 150,000 tons and for 1931 290,000 tons.

In addition to this, there are also plants in various countries in production and projected. In Norway, the arc process has almost been displaced by ammonia plants, the electrical power being utilized for the production of hydrogen.

The other systems in use are all developments of the original Haber process, working at different pressures or temperatures, or using newer catalysts. Billingham uses the Haber process, and the source of hydrogen is water gas. The Claude process works at about 1000 atmospheres. The Casale process works at 600 to 700 atmospheres and about 500° C., while the Mont Cenis process works at 100 atmospheres, and temperature about 400° C.

The Mont Cenis process is extremely interesting because of the possibility of working at a lower temperature due to the great activity of the catalyst employed. The reduction in working temperature allows the use of ordinary Siemens-Martin steels instead of costly alloy steels, and the probable future developments will be in the discovery of even more active catalysts, as the modern trend in industry is in favour of lower working temperatures.

In addition to the original Mont Cenis plant, completed in 1928 and designed for a maximum production of 24,000 tons of fixed nitrogen per annum, there are plants in operation in Germany, Holland, France, and America, and new ones being erected.

Use of Coke Oven Gas.

These newer plants use coke oven gas as the source of hydrogen, which is purified by low-temperature condensation of the remaining constituents. The latter contains nearly 50 p.ct. of methane, and can be utilized as a fuel. The cost of hydrogen made by this process compares very favourably with that made from water gas. The combination of large iron and steel firms using coke ovens with plants for converting the hydrogen into fixed ammonia, as is the practice in France, is the rational method for decreasing costs on both sides.

Now let us turn to a consideration of the bye-product ammonia industries. At the beginning of the twentieth century the Gas Industry was in a happy position, as it practically had the monopoly of the ammonium sulphate market, and the product was a distinct asset. The recovery from bye-product coke ovens became of increasing importance, but the total output did not keep pace with the demand. After the war there was an upward trend in prices, and it reached the high-water mark in 1920. From this point, however, the rapidly increasing production of synthetic ammonia had its effect, and prices fell away rapidly, until now it is only about £4 10s. per ton. What was at one time an important source of revenue has now become in many cases a liability.

The yearly output of ammonia from gas-works in this country is roughly equivalent to 170,000 tons of ammonium sulphate, and this still has to be disposed of in some way. It is no use looking forward to the time when ammonium sulphate will return to its old price, as this state is very unlikely to come about. It must be recognized to-day that the monopoly once held by Chile nitrate and the gas-works is definitely broken. The synthetic industry will be quite able to cope with the demands of the future, and the price of ammonia products will be fixed by the cost of manufacture and not by the quantity available. The question of what has to be done with regard to the ammonia problem by gas-works has been exercising the minds of people connected with that Industry for some years.

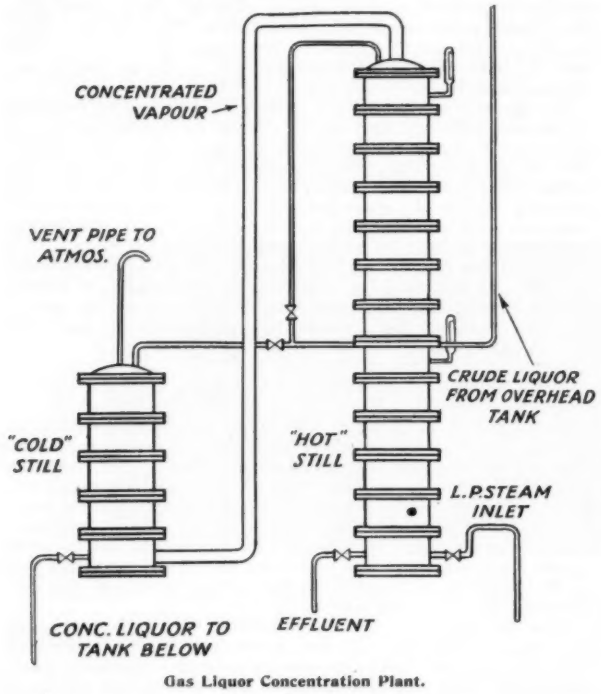
Hollings and Smith in the Report of the Ammonia Sub-Committee to the Institution of Gas Engineers in 1930 stated that the application of the direct and semi-direct process for ammonia recovery is worthy of examination in works carbonizing more than 300 tons of coal per day. In

the B.A.S.F. Report for 1930, a comment is that there are only 30 plants in Great Britain which come above this limit, and there are 741 statutory, and a few hundred non-statutory, undertakings below it.

In the discussion at the meeting Mr. W. Wilson described experiments, in which crude gas, compressed and freed from light oils, was treated with water, and all the ammonia was removed as carbonate.

A Central Factory.

In the case of plants in which it is not economical to erect an ammonium sulphate plant for their own ammonia recovery, the only practicable method of disposal is to deliver it to a central factory, where the combined output of several undertakings can be dealt with on an economical scale. Hollings and Smith thought that consideration should be given to the organization of district co-operative schemes for the treatment of gas liquor. At present the gas-works have to pay the chemical factory to remove gas liquor, and this debit increases with the distance from its destination. Parrish recommends the production of concentrated gas liquor of 70 oz. strength by concentration at the gas-works, and in the "Chemical Age" of June 21, 1930, considers the economics of the question. He draws the conclusion that in the case of small gas-works it pays to concentrate the liquor. Parrish has also described an automatically regulated still for the production of concentrated gas liquor, and this question of automatic control of the concentration is of very considerable importance.



Gas Liquor Concentration Plant.

The Chemical and Metallurgical Corporation, as such a central factory for the production of ammonium sulphate, has itself made some effort to solve the problem of the disposal of gas liquor, and to remove the present anomaly that the revenue from the manufacture of ammonium sulphate is taken up in railway costs. This increases with weaker liquor, and it has happened that the fall in the value of ammonium sulphate has coincided with a general weakening in the average strength of the gas liquor produced.

The ideal plant for dealing with gas liquor would be some kind of filter, which would retain the ammonia contents and allow the water contents to run to waste, but such a filter has not yet been developed, and the only available apparatus is the still, which removes the ammonia as gas and the water as effluent.

The Chemical and Metallurgical Corporation have given particular thought to the design of an apparatus for the production of 3 p.ct. ammonia liquor direct from weaker liquor, and not the production of 20 p.ct. liquor for sale as such. The aims have been:

(1) Small size and cheapness of the plant required.
(2) Simplicity and ease of control.
(3) Freedom from possibility of blockage by ammonium carbonate.

The problem initially seemed very easy of solution, but in practice it did not prove to be so simple, and the small still we have evolved, although it appears simple, represents the outcome of much experiment and trial. A new principle has been embodied which has been covered by Provisional Patent No. 39276.

In the "hot" still a steam inlet at the bottom section serves to strip and fractionate the regulated stream of weak liquor entering at the top section, and the stripped effluent flows away at the bottom of the still. The free ammonia and other volatile constituents pass from the top of the "hot" still at about 80° C., into the bottom of the smaller or "cold" still, where it is absorbed by a stream of by-passed weak liquor, and the amount of liquor by-passed in this way can be regulated to give the required concentration in the liquor delivered from the bottom of the "cold" still (see diagram). No trouble has been experienced with blockage by ammonium carbonate of the still outlet carrying the concentrated ammonia vapours, and the mechanical isolation of the absorber section from the still prevents the undue heating of the former by conduction.

A typical test on this experimental plant with weak liquor of the composition 1·14 p.ct. free ammonia, 0·51 p.ct. fixed ammonia, gave the following figures:

Volume of weak liquor concentrated	100 galls.
Concentrated liquor produced	29·2 ,,
Composition of concentrated liquor	3·46 p ct. free ammonia
	0·46 p.ct. fixed ,,
Percentage of free ammonia recovered in concentrated liquor	89·0
Percentage of fixed ammonia recovered in concentrated liquor	26·5
Effluent volume	83·50 galls.
,, composition	0·58 p.ct. total ammonia
The working loss of ammonia was	1·5 p.ct.
Steam consumption	145 lbs. steam L.P.
Rate of treatment of weak liquor	100 galls. per hour
	10·7 tons per day

The effluent could, to some extent, be used over again in the scrubbers and so recover the fixed ammonia and increase the natural strength of the liquor, which at present is reduced by water washing.

Not a Promising Outlook.

Apart from such contributions to the problem, the outlook for the producers of bye-product ammonia is not very promising at the moment, as is borne out by such pronouncements as that of Sir David Milne-Watson in the annual review for 1930 in the "Chemical Age."

So much for the present with its bewilderingly rapid change of outlook in chemistry generally. What were established processes but yesterday are almost out of date to-day, and the plants erected are becoming obsolete. We are undoubtedly only at the beginning of a new era of chemistry—an era of synthesis from the simplest components. Nitrogen and oxygen are produced readily and cheaply from the atmosphere. Hydrogen is produced from water and carbon or coal, by combination with nitrogen produces ammonia, and the oxygen is then used to convert this into nitric acid. The bye-products in the preparation of hydrogen are carbon monoxide, carbon dioxide and methane, and already the technique of high-pressure reactions with the aid of catalysts has been utilized to effect the combination of carbon monoxide with hydrogen to form methyl alcohol. This alcohol is now turned out commercially in an almost pure state, and is rapidly approaching the price of ethyl alcohol. Pure ethyl alcohol, normal butyl alcohol, acetone, amyl alcohols, ethylene oxide, triethenolamine, and their derivatives are all now produced in large quantities by fermentation or from gases produced from cracking oils, &c., while formaldehyde, acetaldehyde, acetic acid, are all produced synthetically from simpler carbon compounds.

It seems very probable that before long the production of organic chemicals will pass into the domain of synthetic chemistry with carbon from coal, oxygen and nitrogen from the air, and hydrogen and oxygen from water as the starting products. If the production of these compounds grows to the extent that seems likely, it is possible that the production of ammonia from nitrogen and hydrogen may become a sideline in the great synthetic chemical industry, and ammonia itself will have completed a cycle, originally a bye-product of the Gas Industry, now a prime product, and later again a bye-product, not in this case of the Gas Industry, but of the synthetic organic chemical industry.

Owing to the available time having been spent on the works, there was no time for much discussion upon the paper.

Mr. H. P. Lupton, B.Sc. (Liverpool), and Mr. D. Benson, B.Sc. (Bolton), respectively moved and seconded a vote of thanks to the authors for their paper, to which Mr. Riley responded.

Erection of a New Spiral Gasholder in an Existing Tank

By H. S. Adams, Assoc.M.Inst.Gas E., Assistant Engineer to the Bilston Gas Company

[Extract of a Paper before the Midland Junior Gas Association in Birmingham on Feb. 5]

Specifications for a new holder to be erected in an existing tank were drawn up in 1929, and tenders invited. The contractor was required to dismantle carefully the old holder and supply and erect the new one. The new holder was to be equipped with an anti-freezer device, ladders, and handrailing round each lift. All materials to be of British manufacture and from British mills. The sheets to be up to the thicknesses specified along the edges, and the weight of a sheet would not be accepted as evidence of its thickness; also the sheets were not to be submitted to any mechanical stretching. The corners of the sheets at the lap joints were to be thinned by a milling machine, and all holes other than in the sheets were to be drilled. Ten steel bases had to be provided at the positions occupied by the columns of the old holder, and also ten intermediate ones. The contractor was also required to give one month's notice when he was ready to commence work, and the job had to be completed in eight calendar months from the date of acceptance of the tender. Tenders were submitted, and the contract was let to Messrs. C. & W. Walker, Ltd., of Donnington, on May 29, 1929.

The concrete foundations for the ten new intermediate bases, the fixing of the necessary holding-down bolts, the extension and alteration of the rest blocks in the bottom of the tank, and the building-up of the centre pier were the subject of another contract which went to Mr. William Withers, of Bilston.

The contractor lost no time in getting to work, for, on June 1, the one month's notice was received. The holder was deflated, valves were closed and the syphons flooded, and the manhole covers were removed to allow a passage of air to blow the gas out of the crown. Of course, we took very careful precautions to make sure that all the gas was effectively removed from the crown before stripping was commenced. Not only did we satisfy ourselves that the holder was entirely freed of gas, but we pumped air for some days under the crown, to ensure that no "gas pockets" had collected underneath the top curb of the holder.

As soon as the old holder was cleared out, the tank was cleaned up. The tank is a brick one and it was found necessary to re-point it in one or two places. A circular subsidence was found in the tank bottom. It appears that there is an old pit shaft under the tank which must have been discovered when the tank was originally excavated, and it had apparently been either filled in or bridged over. It had subsided a little and we floated it over again with concrete to the level of the tank bottom. The rest blocks were levelled up and extended to accommodate the third lift, and the centre pier was built up to the required height.

The new holder is a 3-lift spirally guided one, the inner lift being 95 ft. 6 in. in diameter by 24 ft. 6 in. deep. The middle lift is 97 ft. 9 in. diameter by 24 ft. 6 in. deep, and the outer, 100 ft. diameter by 24 ft. 6 in. deep. The crown is dome shaped, having a rise of 5 ft. to the centre. There are ten guide rails at an angle of 45° on the inner lift, fifteen on the middle, and twenty on the outer.

Commencement.

Erection was commenced by lowering into position on the rest blocks the cupping of the inner lift, which was delivered in ten lengths having the adjacent row of sheets rivetted on. The cup is 1 ft. 6 in. deep, formed of 8 in. by 2½ in. channel and having a skirting plate ¼ in. thick, with a 2½ in. by ½ in. flat bead rivetted round the upper edge. The cupping having been rivetted up into one complete circle, the side sheets were built up row by row, they being of 11 gauge steel except the ones at the back of the guide rails, which are ⅜ in. thick. The top row of sheets were sent rivetted up together with the angle curb and outer row of crown sheets in ten lengths. These sheets are ¼ in. thick and the angle curb is 5 in. by 5 in. by ½ in., with angle joint cover plates. The top row of sheets is carried up 3 in. above the angle curb and suitably slotted to allow the rain water to run down the guide rails. The twenty 8 in. by 5 in. R.S.J. vertical stays were next fixed, being bolted to the bottom row of sheets and rivetted to the angle curb by means of gusset plates. They extend 4 in. below the cup and are fitted with brackets of 3½ in. by 2½ in. by ⅜ in. double angles rivetted back to back and extended under the cup for stiffening same. The centre post was then placed in position, being 10 ft. 9 in. high and comprising a 10 in. by 8 in. R.S.J., having a 4 ft. 2 in. diameter by ⅝ in. thick crown plate and a 2 ft. 9 in. diameter by ⅜ in. thick base plate. Above the base plate there is a truss plate, 5 ft. diameter by ⅜ in. thick, which is connected to the base plate by long screwed bolts and can therefore be raised or lowered at will. The framework of the crown was built up next consisting of twenty rafters constructed on the Millbourne patent principle. The special features of this truss are its scientific shape and formation. The bottom member follows the lines of its funicular polygon, and the struts which support the rafter bars, being fixed vertically, eliminate all complex stresses, there being consequently no stresses in the diagonals which are used really for constructional and erection purposes. The tension rod is designed so as firmly to embrace the lower portions of the truss at the point of maximum static load, and prevents lateral movement of the lower boom. The long adjusting bolts mentioned above enable the centre post to be raised or lowered so as to bring the stresses in these main bars in perfect equilibrium. Each rafter is formed of a 4 in. by 4 in. by ½ in. tee top boom, a bowstring tie of 3 in. by ⅜ in. flat, four struts of 2 in. by 2 in. by ¼ in. angles and 2½ in. by ¼ in. flat diagonal ties. These rafters extend from the top of the vertical stays to the top of the centre column.

Tension Bars.

The twenty main tension bars, which are composed of two 3 in. by 7/16 in. flats, extend from the top of the vertical stays to the adjustable truss plate at the foot of the centre column. These tension bars are also supported from the rafters at two points in their length by ⅝ in. sling bolts. There are five circles of angle purlins, the outer being 6 in. by 3 in. by ⅜ in., the next 5 in. by 3 in. by ⅜ in., the next 4 in. by 3 in. by ⅜ in., the next 3 in. by 3 in. by ⅜ in., and the inner 2½ in. by 2½ in. by ¼ in. In two spaces between the main rafters opposite each other there are 2½ in. by ¼ in. flat cross bracings. When all these items were in position and secured the centre post was raised, and the whole framework was thereby made taut and all sag removed. The remainder of the crown sheeting was then put on, the outer circle being already there. The row next to the outer circle is 7/16 in. thick and the rest 10 gauge. Certain sheets were omitted to allow of the fixing of the cantilever brackets used for lowering the other lifts into position. The ten guide rails were then fixed, having a red lead tape behind them and small tapered packings immediately below the joints in the sheets. The patent Milcot ladder was next fixed, and the lift was complete with the exception of the crown sheets referred to. The Milcot ladder consists of three stringers, and the rungs are placed alternately on either side of the centre stringer. As this ladder is of necessity very close to the side of the holder, special climbing irons are provided, which, when attached to a man's knees, enable the ascending or descending of the holder to be done with a feeling of greatest security, and the man's arms are freed from strain.

The construction of the middle lift was now started in exactly the same way as the inner one, except that the cup was laid out on baulks of timber spanning the space between the inner lift and the tank wall instead of in the bottom of the tank. When the cup and bottom row of sheets were rivetted up they were slung in hook bolts hung on a long thread secured to cantilever brackets fixed to the main rafters of the crown. The baulks of timber were removed and the cup was lowered down one sheet. As each

row of sheets was rivetted on, the lowering continued until, when the top row and the dip were on, the lift came to rest on the blocks at the bottom of the tank. The lowering slings consisted of a hook bolt with a long thread to which, when the thread was run out its full length, another hook bolt could be fitted and the thread then restored to its original position ready to run out again. For the purpose of attaching the extra hooks each one was released separately and the additional hook attached and the screw restored to its original position. This operation had to be carried out several times. The top row of sheets of this lift project above the dip channel and are slotted similarly to those of the inner lift. The vertical stays were then fixed, there being thirty in this lift of 8 in. by 3 in. R.S.J. They are attached to the cup at the bottom in exactly the same way as for the inner lift and to the dip at the top in a similar manner, having two angles back to back in the form of brackets kneed at the top and rivetted to the dip channel for stiffening same, and at the same time forming bearing blocks for the cup bead of the inner lift. The fifteen guide rails and the ladder were then secured and the lift was complete.

The outer lift was built up in the same way as the middle, being started on the timber baulks with the assembly of the bottom curb, which consists of two 4 in. by 4 in. by ½ in. angles, and which was lowered into the tank as building proceeded. The thirty 8 in. by 3 in. R.S.J. vertical stays are bolted to these angles and are attached to the dip in the same manner as for the middle lift. The twenty guide rails and the ladder having been fixed the cantilever brackets were removed and the remainder of the crown sheeting was put in position and the whole rivetted up.

The refilling of the tank with water was commenced. A special 3 in. main was laid from the road to the tank and water was received at the rate of about 100,000 gallons per day.

While the tank was being filled the steel bases were put into position and the roller carriages fixed. There are twenty carriages on the tank coping, fifteen on the dip of the outer lift, and ten on the dip of the middle lift, the ones on the tank coping being larger and stronger than the others. These roller carriages are constructed on the Millbourne patent principle and consist of a cast-iron carriage carrying two rollers, each 7 in. diameter on the tread. Each roller is formed in one piece with its axle, and the axle has a shoulder on it which fits into a recess inside the carriage. This recess is ¾ in. wider than the shoulder and consequently the axle has that much play in and out to allow for the movement of the holder in a wind. The carriages are also fitted with continuous automatic oil bath lubrication and dust-proof bearings. The holes for the carriages on the dips were drilled at site in order to ensure a perfect fit.

The handrailing was then fixed round the crown of the holder and on the dips of the middle and outer lifts.

Anti-Freezer Device.

There remained only the anti-freezer device to be attached. This consists of a system of steam pipes from which there is an injector into the tank and two cups. The steam is conveyed to the cups by flexible tube, and there are suitable troughs placed on the tank coping and the dip of the outer lift to collect this flexible tube as the holder is deflated. The injectors lie in the water in a horizontal position and at a tangent to the holder, so that the steam not only warms the water, but keeps it on the move round the cups. Each injector has its own independent valve, and means are provided to prevent the water syphoning out of the cups when the steam is shut off. The whole apparatus is duplicated on the opposite side of the holder.

The holder was now complete and ready for testing. The manhole covers were put on and the inner lift was allowed to float and rise with the water in the tank. All the seams on the crown and sides were tested and found to be tight. When the tank was full of water the holder was blown up to full capacity with a Roots blower and all seams were again tested as it rose. It was particularly noticed with what ease the holder cupped on its first inflation. Except for the rise in the water in the tank it was almost impossible to tell just when another lift had commenced to rise. So perfectly were the rollers adjusted that it was possible with a small bar inserted between a roller and its carriage to swing the holder over to the extent of the play allowed. Having been pronounced gas-tight the holder was deflated and then blown up again slowly while being painted. After being painted, the holder was again deflated and the small cock in the crown opened. Gas was then admitted into the holder until all the air had been removed from the crown, when the cock was closed and the holder was in commission. This was on Feb. 14, 1930.

The holder throws ten inches of pressure when all the lifts are inflated, eight inches with two lifts in action, and the inner lift alone gives six inches. The question of pressures is an important one, and it should be noted that this gasholder was designed to give the minimum pressure which we required. A statement has recently been made in the Press that in the case of multiple lift holders, the top lift should be "discounted from a storage point of view." This may, of course, be true in the case of holders erected many years ago when pressure was not such an important factor as it is to-day, but in the case of a new holder, such as this, we, by providing an inner lift throwing the minimum pressure desired, can use the whole of our storage usefully, without having to "discount" any of its capacity.

Discussion.

The Chairman (Mr. W. Macnaughton) inquired if the sheets used in construction were "pickled," and whether the plates and angles were tested by the contractors or the manufacturers.

On the motion of Mr. F. A. Jenkins (Leamington), seconded by Mr. A. R. Myhill (Birmingham), a vote of thanks was passed to the author.

Mr. Jenkins said he had been led to understand that puddled iron—employed in the construction of the holder—assisted in resisting internal corrosion.

Mr. Myhill asked if the erection of a waterless gasholder had been considered.

Mr. W. T. Hobson (Wolverhampton) inquired what weights were added to give the required pressure.

Mr. C. H. Woodfine (Wellington) stated that in a similar holder at Wellington it was necessary to put on about 10 tons of weights to get a pressure of 9 in. Was any trouble experienced with the flexible tubes used in connection with the anti-freezing device?

Mr. J. H. Wainwright (Halesowen) asked what provision was made for a supply of water to replace any loss from the tank due to leakage or evaporation.

Mr. R. J. Milbourne (Messrs. C. & W. Walker, Ltd.) also took part in the discussion. Referring to the wrecking of the gasholder at Copenhagen, he said he understood that the holder had not been thoroughly cleared of gas. Such occurrences were happily rare in England; but one, which occurred a few years ago, led to the Board of Trade asking for certain precautions to be observed. Gas did tend to lodge underneath the crown and cups, and it was necessary that full precautions should be taken before the sheets were cut out.

In regard to the question of using puddled iron, he was conducting tests (not only with this, but with steel and other materials) which would take a few years longer to allow of any satisfactory results, in order to show the relative difference between the lasting properties of these materials. Puddled iron depended upon the skill of the puddler. With wrought iron sheets one got a surface which the present-day engineer would consider very rough, and they would not be accepted by many for that reason. Modern steel sheet had a fine surface. Referring to the question of testing sheets, he said that their gauging on the longitudinal edge was a most important point. In the construction of a gasholder it was useless to have the thickness in the centre of the sheet and not on the edge. The British Standards Specification only took into consideration the weight per foot, and did not trouble about the thickness of plates at the edge; consequently the gas engineer ought to watch that point closely. Everyone would know that in order to obtain pressure from a holder, weight was required; and with any type of holder, if it were desired to increase the pressure, weights had to be added.

Mr. L. B. Chapman (Tipton) asked if the interior of the holder had been coated in any way. As to the water for the holder tank, he said that he had found that where canal water had been used bacterial action had been set up which caused the water to become foul, and town water had to be substituted.

The Author's Reply.

Mr. H. S. Adams, in replying, said that the plates had not been tested. A certificate had been received of every rolling done at the mills; and these had been accepted. The sheets were not puddled. Town water had been used for filling the tank, which, so far as could be ascertained, was perfectly water-tight. With regard to the painting of the holder, the sheets had received a coat of genuine red lead paint before being despatched from the makers' works, and after erection had been painted with two coats of "Torbay" paint. The old holder was made of iron, and they had found that inside it was in splendid condition, but, of course, they had no knowledge of this before it was opened up. Iron had been considered for the sheeting of the new holder, but it would have added about 8 p.ct. to the cost of the job, and he also understood that where iron came in contact with any steel there was a certain amount of electrolytic action set up between the two metals. It was consequently decided not to use any iron in the construction. No trouble had been experienced due to the breaking of the flexible pipes of the anti-freezing device. As they had already a tank provided, they had not considered the erection of a waterless holder. They had utilized the old inlet and outlet pipes, which were 20 in. in diameter. Extra weight had been put into the vertical stays in order to give the required pressure. There was no paint on the inside of the holder other than that applied to the sheets before leaving the makers' works.

Scottish Junior Gas Association (Eastern District)

Address on Gas-Works Statistics

This Association visited the Milton House Works of Milne's Meters, Ltd., Edinburgh, on Feb. 7. The visitors were welcomed by Mr. A. Wallace Cowan, Chairman of the Company, and were conducted in groups round the Works by Mr. McRobbie, the Manager, and by other members of the Staff. The Works were in full operation for the afternoon, so that the visitors could see the various machines at work and the different processes of manufacture.

The members were first taken to the new brass foundry, where they examined general moulding and plate moulding. In the brass finishing shop the machines were shown in operation, and the visitors were particularly interested in the manufacture of the meter component parts. Many of the firm's finished productions—gas and water fittings, pressure gauges, and gas apparatus—were on view in this department. The parties were then conducted to the press shop where meter stampings were being produced. After a visit to the meter component stores, they spent some time in the assembling shop, where different types of meters were in course of construction. The different stages of assembly were fully described. A visit was also made to the shop set aside for meter repairs. The high-capacity meter was next fully explained, and a glass cased meter was shown in operation.

The members then saw wheel cutting machines and index making in operation and the production and assembly of the prepayment attachment. The proving shop was also visited and meters were seen being tested.

Mr. William Gordon, the Chief Inspector of Gas Meters, arranged for his department to be on duty, so that the visitors could examine the meters passing through their final test before being sealed. The visit finished at the brass foundry where metal was seen being poured.

At the kind invitation of the Directors of the Company, the members proceeded to Messrs. Ferguson & Forrester's, where they were entertained at tea.

The PRESIDENT, Mr. D. Yule, thanked Mr. Cowan for his welcome, and Mr. MCROBBIE replied on behalf of the firm.

GAS-WORKS STATISTICS.

By Mr. EDWARD ALEXANDER, of the Edinburgh Corporation Gas Department.

Every business man finds it necessary to keep a record of his transactions, but not infrequently these records are restricted to those financial aspects of his activities which will enable him to prepare proper accounts periodically.

I do not propose to discuss the growth and development of accountancy in general, or even of its more restricted aspect—viz., cost accountancy—although the latter has a distinct bearing on the subject of this talk.

It has for long been realized that adequate financial records were essential to business, but it has not been realized that these financial records merely express, in the guise of £ s. d., facts which, of themselves, are often more illuminating when presented in the form of statistics.

It is not always comprehended that the particulars of an undertaking or business presented in this way are more useful, and I should like to indicate to you briefly a few of the respects in which this is so. Successful business can only be carried on by the intelligent use of past experience so that estimates can be made of future operations. Discrepancies between estimates and actual results will doubtless arise, no matter how skilfully the estimate has been framed, but in estimating on scientific lines, based on carefully kept statistical records, the application of past experience as modified by prevailing conditions will give a more accurate result than were guesswork employed.

Statistics not only enable comparisons to be drawn between past and present results so that the reasons may be found for any changes which may have taken place, but also enable key figures to be worked out on a mathematical basis, which can be applied to past or present results within definite limits of possible error, so that future results can be pre-determined. Statistics is something more than mere counting and involves the conscious application of the scientific mind. The intelligent use of statistics is an aid to administration, and a determinant in policy.

With the growth in size of the productive undertakings, and the necessity for planning ahead as an integral factor of organization, I feel that, at the present time, the development of some form of standard statistics is specially applicable to the Gas Industry. Any business should be prepared to withstand a reasonable degree of fair competition, but in our case we have to compete with a rival aided by the State. That in itself is sufficient cause for us to consider how to improve the efficiency of our works, especially those smaller works in country areas where the competition of the electric grid system will be most felt. Amalgamation may be necessary in some cases on economic grounds in order that the advantage of large-scale production may accrue to the Industry; and where this occurs comparisons will need to be made regarding the relative merits of the individual works, so that the better site may be chosen for the centralization of output.

But even where consistent progress is being made, there is need for a careful survey of the position. Industrial activity and expansion in and around the area of supply should be carefully watched so that the size and amount of future mainlaying and gas storage may be decided upon. It is also just as necessary to note the progress that is being made by the local electrical undertaking, as indicative of the potentialities of the local market for our own product.

To be of any use, our collection of data must be carried out continuously, carefully, and methodically; otherwise the conclusions drawn will be fallacious. The collection of the data is really the foundation upon which we are going to build.

PROCEDURE.

The procedure to be taken consists of the four following steps:

(1) *Observation.*—This deals with the study of the problem to be investigated, with the determination and selection of the types of facts which are likely to be significant in that problem; also with the conditions under which they exist. For instance, in recording throughput of coal per retort we should have to take into consideration the state of the " heats "—whether they were normal or otherwise.

(2) *Enumeration.*—The fixing of the value of the quantity noted and the manner in which these units are to be collected.

(3) *Analysis.*—The selection or interpretation of these values, whether they are crude or corrected and, whether they can be adequately summarized by averages, plotted on graphs, grouped, or classified in certain ways.

(4) *Inference.*—The interpretation of the facts presented.

All investigations must be carried out with an open mind, entirely free from bias, and there must be no pre-conceived ideas as to what the figures are to prove. A number must never be rejected if it seems contrary to what you would expect, just because it appears to differ widely from the average.

The collected data must be presented in such a manner as will allow of the best use being made of the information given. The method employed is important. It must be such that the data can be speedily obtained, easily understood, and their significance grasped without waste of time. Two methods are used in Statistics to present the information gathered, the first being tabulation of results, and the second graphical representation. Even where graphs are used, tabulation of results is necessary.

Tables should not be too large and unwieldy, nor should they be too small and complicated. A happy medium must be struck so that the table is easily read. Wherever possible, footnotes should be avoided. Figures to be compared should be placed in vertical formation rather than horizontal, as the eye has greater difficulty in scanning a horizontal line of figures than a vertical one.

Though tabulation has its uses, it can be understood that a mass of figures is not the best way in which to present the derived information. It is not easy for the eye to retain masses of figures, and this may be got over by presenting the information in pictorial form. This, when properly carried out, appeals to the eye and the mind. Where it takes an effort to visualize a portion of a written statement, a glance at a diagram is sufficient to make the meaning clear.

The use of diagrams involves many different types, and these, like other forms of presentation, require caution in their interpretation. It must be clearly stated if the comparisons are to be made on linear, areal, or cubical dimensions. Diagrams tend to lead to conclusions being drawn without a detailed study of the facts, and they foster a spirit of disregard for details.

The most useful form of comparing series of data is the graph. The values obtained from the successive measurements of data are plotted by points, and the joining up of these points gives a curve which shows at a glance the trend of the figures under view. The great advantage of the graph is that it allows of the plotting of several curves on the same diagram for comparative purposes.

In graphs, the relation between the two axes should be such that no detail is over-emphasized. Experience will

help in choosing the most suitable scales under the circumstances.

Where we wish to compare our ratios with those which obtained in a previous period, we use a logarithmic scale for the plotting of the data. We may either plot the logarithms of the numbers on a natural scale, or the numbers themselves on a logarithmic background. Graphs should include curves of all influences that may affect the result of our investigation, or fallacious conclusions may be drawn.

If, for instance, we are investigating the effect of atmospheric temperatures on the sale of coke, we should have on the same diagram two curves, one showing the fluctuation of temperature, and the other the quantity of coke sold over the same period. It would be seen that the curves bear what is called an " inverse correlation "—that is, the increased sale of coke would correspond with the gradual fall in temperatures. It might be assumed straight away that the former was the natural effect of the latter. But we are not justified in drawing this conclusion without a closer inspection of the situation. Though temperature will undoubtedly have a great effect on the sale of coke, we must not omit to bring into our investigations the prevailing price of coal. By adding to our diagram a curve showing the trend of coal prices we shall be able to judge the effect this has on coke sales. An increase in coal prices will exaggerate the increase of coke sales.

In making statistical investigations, we should note all the existing influences that might affect the results.

Costing.

Costs of manufacture and repairs should be also accurately recorded, and a costing system instituted which will give at any time the costs incurred by each section and sub-section of the works. This, along with the recorded manufacturing results will give a complete history of the progress of the undertaking. Continuous records of costs of repairs should be compared with records of the cost of material over the same period, as a rise in cost of materials will tend to make the repair bill look high in comparison with former periods.

Methodical tabulation of past costs will enable estimates of future expenditure to be made, and statistics will help us to compare the actual costs with our estimates. The data of wages and material lend themselves to systematic collection.

Instances will come to your mind of suitable subjects of investigation, according to the plant with which you are familiar. I believe that the study of peak loads would be very interesting, in both manufacture and distribution.

Statistical methods should be applied to all cases where continuous records are kept of various data, for long and short periods.

Not only is a knowledge of statistics useful for the internal organization of the works, but it allows a more intelligent survey of Board of Trade and Fuel Research records.

The present-day manager of a large works is called upon to inspect an increasing number of statements and business tables, and, to interpret these accurately, he must have a thorough knowledge of their construction and purpose. A course in practical engineering does not include this subject, and I feel that wherever necessary and possible, members should include it in their studies.

Discussion.

Mr. D. Yule (Alloa), in opening the discussion, said that Mr. Alexander's address recalled to him a paper given by Mr. J. Campbell, of Dunfermline, on " Keeping a Grip of Things." He thought it very necessary to keep data, not too elaborate, but just in the most simple method required. For large works the analytical mind was necessary to comprehend and utilize the various statistical records compiled.

Mr. J. W. Napier (Alloa) thanked the author of the address, and stated that in the midst of engineers, chemists, and chemical engineers, statistical officials had always been with them, but nowadays they were coming more into prominence, because the commercial side of the industry had assumed greater importance. When expenditure was considered the cost of steam was usually overlooked, and this in manufacture was one of the principal items. The quantity of fuel and water used in the boilers was usually noted, but economies could be effected by investigation being made into the amount of steam used in vertical retorts and sulphate plant. These places used large quantities of steam, but steam meters were seldom found in use. Modern coal analysis could very seldom be given by even talented men in the coal trade, and some coals supplied contained large quantities of moisture and ash, which sometimes cancelled out 10 p.ct. or 20 p.ct. of estimated value. In small gas-works too little attention was given to this, and he thought economies should be made at the very beginning.

Mr. S. Smith (Dunfermline) drew attention to the remarks concerning the methods employed in the collection of costs.

Mr. Alexander, in reply, stated that each operation in all sections of the work was allotted a cost head number. This allowed of rapid compilation of the separate costs. Statements were taken out in weekly, monthly, and yearly periods, monthly perhaps being the most convenient for the regular survey of results.

Mr. D. Garrie (Burntisland) remarked that accuracy was very necessary in the collection of data, and agreed that some very interesting information could be gathered from the study of peak loads, particularly with regard to the question of differential charges in the price of gas.

A hearty vote of thanks to Mr. Alexander terminated the meeting.

Wales and Monmouthshire Junior Gas Association

Paper on Domestic Hot Water Supply

The fourth meeting of the session took place at Newport on Saturday, Jan. 24. The members assembled at Sweeting's Café, and the chair was occupied by Mr. C. H. Collins, President of the Association.

Mr. C. B. Felton (Newport), on behalf of the Chairman and Directors of the Newport Gas Company, welcomed the members.

At the outset, the members stood in silence as a token of respect to the memory of the late Mr. T. Hunt. Mr. Hunt had been an active member of the Association since its inception.

Mr. A. D. Howell (Neath) was elected as Representative on the District Education Committee, in place of Mr. A. E. Martin (Merthyr), who had resigned.

DOMESTIC HOT WATER SUPPLY.

By W. G. Biggins, of Newport.

[Extract.]

This paper deals with domestic hot water supply storage systems only, and not with hot water apparatus of the geyser or instantaneous type.

In designing a hot water supply apparatus it would be well to remember that its efficiency will be judged by its ability to provide a satisfactory outflow of hot water at all draw-off taps likely to be turned on during the period of the greatest demand. Therefore, to design a satisfactory hot water system, it is necessary to ascertain, as far as possible, the quantity and temperature of water required during different periods of a busy day. It is also well to remember that the volume of hot water used by different persons varies considerably. One person may be satisfied with 10 gallons for a bath, while another will use double that quantity. The requirements for a bath in hotels, boarding houses, and public baths generally exceed those of private houses. These considerations lead to the conclusion that, in practice, the demand for hot water is so uncertain that it is desirable to provide a safe margin of heating power and storage capacity.

Coke Boilers.

Considering first of all an installation in which the heating agent is a boiler fired by solid fuel, the essential points to consider are that the heating power of the boiler and the capacity of the storage vessel should be so proportioned as to satisfy the varying hot water requirements of the establishment in which they are to be employed. The diameter and arrangement of the cold water feed pipe and the hot water service should ensure an adequate output of hot water at all taps likely to be opened at one time. Where the quantity of hot water withdrawn is more or less constant throughout the day, the heat energy transmitted to the water by the boiler must be sufficient to keep this temperature good.

When designing hot water apparatus for establishments where large quantities of hot water are required, it is a good plan to prepare, if possible, a scheduled estimate of the quantity and temperature of hot water required during varying periods of the day. Assuming that, in a large establishment where the apparatus is in continuous use and the quantity of hot water required between 7 and 8 a.m. is 130 gallons (this amount being the highest hourly output during the day), 60 gallons between 8 and 9 a.m.,

50 gallons between 6 and 7 p.m., and at other periods of the day approximately 30 gallons down to 10 gallons per hour, then the hot water storage vessel should have a capacity of 150 gallons and the boiler be capable of providing 70 to 75 gallons of water raised from 50° Fahr. to 150° Fahr. per hour.

As the draw-off hot water taps would be situated some distance away from the hot water storage vessel, the hot water service draw-off supply pipe would circulate back through a secondary return pipe to the hot water storage vessel, making a secondary circuit which would pass as near as possible to all hot water draw-off points. This circuit should be lagged, to prevent heat losses during the day. A night valve can be fixed in the hot water draw-off service supply and shut down at night to economize fuel consumption when hot water is not required.

As it is not always possible to provide a schedule, the following method is usually satisfactory.

In the average house 20 gallons (of hot and cold water together) may be taken as a fair average for a warm bath by the persons of the household and 5 gallons of hot water for a lavatory basin and sink; then a hot water storage of 30 gallons will be usually found quite sufficient. No secondary circuit should be required in this type of house. A separate boiler or suitable range boiler should be installed of a capacity of heating 30 gallons of water through 50° Fahr. per hour.

In larger houses the hot water apparatus should require the following fitments on the average:

Example.—Fitments to be Supplied with Hot Water.	Required Storage.
2 baths—30 gallons each	60 gallons
2 basins—2 ,, ,, ...	4 ,,
1 sink— 5 ,, ...	5 ,,
Total	69 or 70 gallons

Where a gas circulator is used in combination with a solid fuel boiler, or in lieu of same, less storage may be permitted according to the capacity of the heating power. Where a gas circulator alone is employed, a cut-out valve is advisable to vary the effective capacity of the storage vessel to obtain early morning hot water quickly.

Hot water boilers are constructed of wrought iron, steel, cast-iron, or copper. The advantages of wrought-iron or steel boilers are that the shell is of uniform thickness. They will stand more rough usage and higher pressures than those of other metals. The thickness of the plates should be no less than $\frac{1}{4}$ in. for small sizes, and $\frac{1}{2}$ in. for larger boilers. Cast-iron boilers are extensively used. Contrary to general opinion, the thermal efficiency of a copper boiler is but very little higher than that of an iron or steel boiler.

Owing to varying conditions which obtain in practice, it is impossible to lay down hard and fast rules to govern the sizes of the various components of the primary circuit. The following method is safe for primary circuit where the run of pipe is mainly vertical:

Heating Power of Boiler in Gallons of Water Heated through 100° Fahr. per Hour.	Diameter in Inches of Flow and Return Pipes Between Boiler and Storage Vessel.
Up to 15 gallons of water	$\frac{3}{4}$ in.
15 ,, 30 ,, ,, ,, ...	1 ,,
30 ,, 70 ,, ,, ,, ...	$1\frac{1}{4}$,,
70 ,, 130 ,, ,, ,, ...	$1\frac{1}{2}$,,
130 ,, 250 ,, ,, ,, ...	2 ,,

Storage Cylinders.

In the average modern house the cylinder type of storage vessel is chiefly employed, and is generally fitted in the linen closet, if available, with the cold water feed cistern fixed above it. The advantages are that the householder can air the linen in the closet by the heat lost from the surface of the cylinder, and at the same time the cold water cistern is prevented from freezing in the winter. A heat jacket of suitable material can be fitted on the storage vessel to reduce heat losses; and to compensate for this a small copper coil could be fitted in the closet attached to the circulating pipes, with a valve to shut off the coil when not required. Storage vessels are constructed of galvanized sheet iron plates; but in hard water districts, owing to corrosion and rusting, the galvanized iron plates have not a long life unless a special heavy gauge galvanized iron is used. Therefore copper cylinders, while dearer than galvanized tanks in initial cost, work out cheaper in the long run. The tank system is generally seen fitted in the older class of house, fixed in the roof at the top of the house, but it is a bad practice, owing to the exposed position and consequent danger of freezing.

When fixing a domestic hot water supply apparatus it is of great importance to take every care with the primary circulating pipes from the boiler to the storage vessel. In hard water districts the whole of the installation piping should be in lead, as corrosion and furring up would occur if iron pipes were employed. Heavy-gauge copper pipes are fitted on first-class jobs, but in the average house lead is mostly used. In fixing these pipes a board run should be employed and the pipes should be firmly stayed to it. Brass union connections should be used for final connections to the hot water cylinder and heating boiler. If the circulating pipes to the boiler should unavoidably have to come in contact with the flue and the fire, short lengths of heavy-gauge copper pipes should be used to connect the lead pipes outside the range or combination grate. If the primary circulating pipes have to run under floors to the storage vessel, then it is essential to have a rise to the storage cylinder of not less than 1 in. in 10 ft. as the lowest margin of rise from the boiler. Care should be taken to allow no sagging or dips when running pipes under floors. Board runs should be used at all points. An emptying cock should be fitted on the lowest point on the primary return pipe of the installation, a point often missed. A safety valve should be fitted on the boiler in all cases. This is often omitted, reliance being placed on the vent pipe fitted on the top of the storage vessel to terminate over the cold water storage cistern.

Gas Circulators.

Gas-heated circulators are being improved in both appearance and design, and especially in regard to lagging, thereby reducing surface heat losses. In one circulator which I have in mind the inflowing water has to pass through a series of small tubes, and is thereby retarded as it passes through the heating unit, thus obtaining a higher efficiency from the apparatus. The interior of this particular appliance can be renewed at a low cost. Another lagged type, in this case a hot water storage vessel with a direct coupled heating unit attached, with water passing through the heating unit at two gallons per hour is suitable for flats and small houses. No primary circulating pipes are required, the cold water cistern, feed pipes, and vent pipes with draw-off service pipes being all that are necessary.

In cases where the circulator has to be fixed in conjunction with an existing coal fired installation, the primary flow and return pipes from the gas circulator must be connected to the existing flow and return pipes between the range boiler and hot water storage cylinder. These should be fitted as near as possible to the hot water storage cylinder at as sharp an angle as possible, so as to let the water have an easy flow to the cylinder. If the existing circulation pipes are iron, **Y** or pitcher tees should be employed. If it is found necessary to fix primary circulating pipes direct from the circulator to the hot water cylinder, Colman flange joints with rubber gaskets should be employed.

In fixing a circulator the flue outlet should be fitted with a hood vent piece with condensation through the condensing draw-off tube for the purpose of collecting the condensation of the products of combustion in the flue pipe. A sleeve should be fitted in the wall of the chimney, with the terminus of the flue pipe inserted for the purpose, from time to time, of removing the flue pipe easily for cleaning purposes. The flue pipe must be of ample capacity to carry off the products of combustion. If a flue outlet has to be taken outside, a suitable baffle should be fitted to prevent downdraught.

Regarding the merits of gas-heated circulators against electric water heaters, gas would take first place in efficiency and cost. I know of only two cases in Newport where electric water heaters are employed solely to heat up the hot water domestic supply. There are other installations, but these are only being used after the solid fuel boiler has heated up the water, the electric heater being switched on merely to keep the water hot.

Discussion.

The President (Mr. C. H. Collins) said he considered the lagging of the primary flow and return pipes essential to efficient results.

Mr. H. D. Hazell (Newport) suggested that in the smaller class of house a secondary circulation ought not to be necessary.

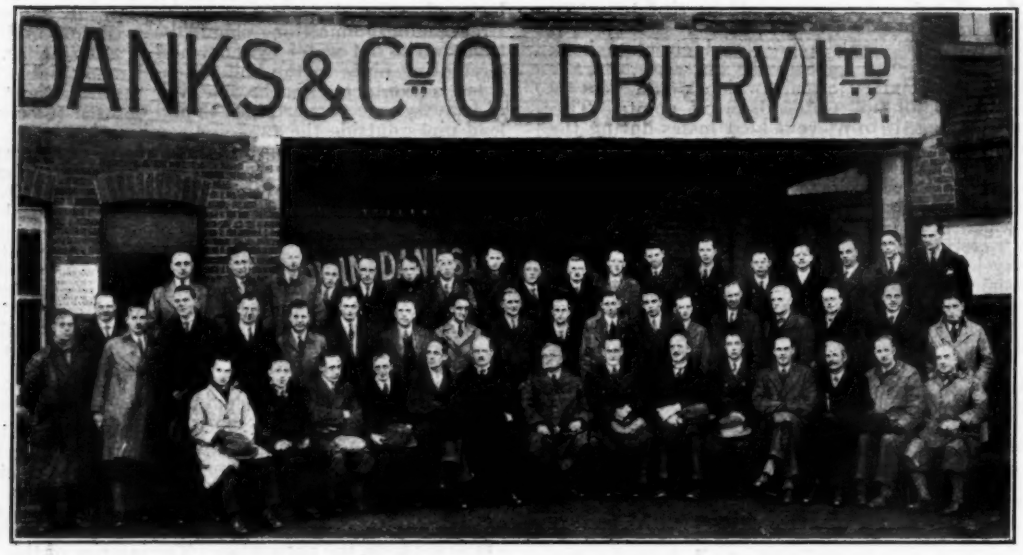
Mr. B. J. Bell (Cardiff) said there was a danger in stressing the technical side too much, and paying insufficient attention to the selling side. The price of some appliances, *plus* the fixing charges, militated against their ready sale. Consumers in these times could ill afford to pay a sum in the region of £20 for cash or on hire purchase. He had recently been turning his attention to a burner which, after some experiment, had been designed to fit under the saddle-back boiler of the coal range. This was considered a good means of providing the consumer with facilities for obtaining hot water supplies at a very small outlay, and it would increase gas consumption.

Mr. Biggins thanked the members for their comments.

Mr. T. Lane proposed, and Mr. J. Viney seconded, a vote of thanks to the author. A vote of thanks to the Chairman and Directors of the Newport Gas Company for hospitality extended was proposed by Mr. B. J. Bell.

Midland Junior Gas Association

Visit to the Works of Messrs. Edwin Danks & Co., Ltd.



On Jan. 24 the Association visited the works of Messrs. Edwin Danks & Co. (Oldbury), Ltd., Oldbury, near Birmingham, and were shown over the firm's extensive plant. The products include the manufacture of Lancashire boilers, dish-ended and flat-ended; "Economic" boilers, brickwork and self-contained types; Cornish boilers; and the latest type of waste-heat boilers (Spencer-Bonecourt, Ltd.), as used for the recovery of waste heat in gas and steel works.

Heavy presswork for all classes of work was also inspected, together with a wide range of miscellaneous plate work which included all types of steel chimneys and duct work of various descriptions. Perhaps the most interesting section of this portion of the works was the grit-arresting plant manufactured by the Company for the Pneumatic Conveyance and Extraction (1929), Ltd. It was noticed that the cone portion of this plant was made of a specially hard armour plate steel to resist the abrasive actions of the escaping products of combustion.

Later, a representative of the Pneumatic Conveyance and Extraction (1929), Ltd., gave a short lecture on "Dust Extraction," at which complete models were shown and which gave an exact description of the operation of the plant.

Various types of boilers, together with other work, were seen in different stages of manufacture, together with the plant necessary for the firm's products, consisting, in addition to the usual complement of machines, of heavy plate bending rolls, special drilling machines for boiler manufacture, by which horizontal and vertical seams can be drilled simultaneously, hydraulic presses of various descriptions for pressing ends up to 9 ft. diameter by 1½ in. thick, and the latest form of guillotine machine capable of shearing plates up to ¾ in. thick cold.

The firm produce all their own power, including gas, electricity, and hydraulic and pneumatic power, the steam supply being derived from a battery of dish-ended Lancashire boilers complete with superheaters and fuel economizers.

Various processes of manufacture were demonstrated by members of the Engineering staff, and in the case of Lancashire boilers a fully detailed explanation was given of the various operations, including that of marking off, bending, drilling, welding, pressing, rivetting, fullering, caulking, final assembly, and test.

At the conclusion of the inspection the visitors were entertained at tea, the thanks of the members being expressed to the Management and Staff by the President—Mr. W. MACNAUGHTON—seconded by Mr. J. H. WAINWRIGHT (Halesowen).

PARLIAMENTARY INTELLIGENCE

[From Our Special Correspondents.]

House of Lords.

Private Bills.

The Gas Light and Coke Company's Bill has been passed by the Examiners, read a second time, and committed. The Lowestoft Water and Gas Bill and the Royston and Brodsworth Gas Bill have been committed.

Petitions have been presented against the Gas Light and Coke Company's Bill by the Great Western Railway Company and the Southend-on-Sea Corporation. A petition has been presented by the Hemsworth Rural District Council against the Royston and Brodsworth Gas Bill.

Gas Fund.

The accounts for the year ended March 31, 1930, of the Gas Fund under the Gas Regulation Act, 1920, have been presented and ordered to lie upon the table.

House of Commons.

Shortage of Shillings for Gas Meters.

Sir W. DAVISON asked the Chancellor of the Exchequer whether he was aware of many complaints from persons making use of shilling-in-the-slot gas meters for lighting and heating, of the serious shortage of shillings whereby they are inconvenienced in obtaining a regular supply of gas, and whether a larger supply of these coins could be issued to the banks for distribution to the public.

Mr. SNOWDEN, in reply, referred to the answer which he gave on Jan. 22 to a similar question by Sir K. Vaughan-Morgan, to the effect that a few complaints had been received, but that, as a result of the discussion between the Mint and the Banks, an improvement in the position had resulted, while further steps were being considered.

Sir W. DAVISON then asked if it would not be a profitable transaction to the State, in view of the very low price of silver, to mint an additional number of shillings, when there was such a public demand for them.

Mr. SNOWDEN replied that the Mint were taking the matter into consideration.

Hire Purchase Bill.

The Hire Purchase Bill, which is being opposed by certain sections of the gas industry, has been put down for second reading on Friday next, Feb. 20, but may not be reached, as there are two other Bills in front of it. A motion for its rejection appears in the names of six Conservative M.P.'s: Mr. Maitland, Sir Robert Gower, Rear-Admiral Beamish, Mr. Ross, Sir Samuel Chapman, and Mr. Meller.

Commercial Gas Company

ANNUAL ORDINARY MEETING

The Annual Ordinary Meeting of the Company was held last Thursday, at the Cannon Street Hotel, E.C.—Dr. CHARLES CARPENTER, C.B.E., M.Inst.C.E. (the Chairman), presiding.

The GENERAL MANAGER AND SECRETARY (Mr. F. J. Bradfield) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

The CHAIRMAN: Ladies and gentlemen,—Before dealing with the report and accounts for the past 12 months, I think I ought to say a word or two as to how it has come about that I am occupying to-day a chair so worthily filled for 31 years by Mr. William Graham Bradshaw, and why, at a time of life when most men seek a relief from some of their business responsibilities, I have undertaken the serious tasks associated with the Chairmanship of this historic and important undertaking. In order to make my attitude in this matter clear I must refer shortly to the particular position in which the gas industry finds itself to-day. It has existed for over a century; for the first half as a practical monopoly in the distribution of light from a central source, and for the latter in competition with other fuels, with oil, and with electric energy.

GAS UNDERTAKINGS AND COMPETITION.

Now a certain balance of power, of more or less equilibrium of service, came about as between all those interests, and the gas industry occupied among them a definite standing of accepted usefulness and financial security. One fine day, however, politics intervened, and all three parties, ever on the lookout to make their platforms attractive, saw in the magic word "Electricity" the opportunity they sought, and as a consequence those responsible for the supply of gas to-day are faced, not with competition of the ordinary commercial kind, but with State-aided, State-boosted electricity. It happens—I am entitled to no credit for what has been the result of a sequence of fortuitous accidents—that I have had throughout my life an unusually intimate association with the gas supply of the Metropolis, and when Mr. Bradshaw invited me in the first instance to become a member of this Board, and later take upon my shoulders the responsibilities of its Chairmanship, I accepted a proposal of which, highly flattering though it was, I would have been glad under other circumstances to be relieved. Ladies and gentlemen, the Company owes a great debt to Mr. Bradshaw for the sound and admirable manner in which it has developed during the long years of his Chairmanship, and before this meeting terminates I hope one of you will see to it that an expression of our appreciation becomes included in our record of this day's proceedings.

THE AGREEMENT WITH THE SOUTH METROPOLITAN COMPANY.

The most important happening in the Company's affairs during the past year was, I think you will agree, the agreement with the South Metropolitan Company. This was fully explained at the special meeting of the proprietors held on July 30 last, and there is no necessity for me to deal with it in detail to-day, but you will notice from the Directors' report on the front of the accounts that the applications for the exchange of stock, which was one of the principal conditions of the agreement, exceeded the amount offered. It is, of course, too soon to discuss the benefits accruing to the Company under it, but your Directors believe that material advantage will result, and they have every confidence that future accounts will justify that belief.

The one disappointing feature of our 12 months' working has been the falling off in the consumption of gas. This is down by just over 6 p.ct., compared with the corresponding period of 1929. I do not want to minimize this, for it is a fact the bearing of which we cannot disregard, and which is engaging our very serious attention, but I must point out that the comparison is made of a mild season with a hard one, and that our own experience is shared by most other undertakings similarly situated. We not only supply heat for cooking food, but also for warming houses, and while the former requirement is fairly steady, the latter fluctuates with climatic conditions. There is no doubt, too, that trade depression has a similar effect upon us as upon others engaged in supplying the wants of our civilization, and that we are feeling the results of enforced economy in the use of one of our everyday conveniences. It is, however, gratifying to state that the output to date this year exceeds that of the corresponding period of 1930.

THE DIVIDEND.

Financially we have had quite a good year. We have reduced our capital account by some £14,000, partly by the sale of surplus property and partly by writing down assets. This is very satisfactory. We have increased the balance carried to the net revenue account by £20,454, a result due to savings in all items of expenditure. After adding a saving of £2813 for interest and deducting the deficit of £9918 on the previous year's working, the net result is that the balance to be carried forward to the current year is increased by £13,349. You will, I am sure, agree that these figures fully justify the Directors recommending a dividend at the rate of 6 p.ct. per annum for the past half-year. The dividend for the last half of the previous year, you will remember, was 3½ p.ct. per annum, but I would remind you that there is no difference on the full year. For the first and second halves of the year 1929 dividends of 2½ p.ct. and 3½ p.ct. respectively were paid, whereas for the year under review the dividends for both half-years, if the recommendation being submitted to-day is approved, will be 3 p.ct., making 6 p.ct. for the year.

It may be noticed that the sums shown in the balance-sheet under employees' pension fund and amount invested are very much less than last year. Hitherto it has been the practice to show the pension fund investments in the accounts, but as these moneys are invested in the names of the trustees of the fund and are not the property of the Company it has been decided not to show the amount in the balance-sheet in the future.

PLANT AND PROPERTY KEPT EFFICIENT.

The satisfactory working results of the past year reflect great credit upon our staff and employees. Those of you who may be associated with commercial or industrial undertakings are fully aware of the important part played by "overheads" in regard to financial results. Standing charges cannot safely be diminished, and if output is less their quota increases operating costs. The figures we have placed before you in the accounts, however, have not been achieved by cheeseparing in the maintenance of our property and plant. This has been not only kept efficient but, I think it only fair to add, a certain amount of leeway has been made up. We have, for instance, been overhauling our gasholders recently, and in the year under review completed the reconstruction of one of these at Poplar. We are arranging a similar programme this year with regard to our largest one at Stepney. We have also extended our naphthalene plant there, and have reconditioned our purifiers. At Wapping and Poplar similar work has been completed. I am pleased to give my testimony to the efficient manner in which this work was designed by and carried out under the directions of our engineering staff. The yields per ton of coal carbonized, too, are excellent, the make of gas, coke, tar, and liquor all showing improvement on the previous year.

LARGE SALES OF LIGHTING, HEATING, AND COOKING APPLIANCES.

In some quarters there is an impression that gas lighting has ceased to exist. We, of course, know that this is not so, and when I tell you that during the year we sold to our slot-meter consumers alone over 44,000 complete sets of incandescent burners, mantles, and globes you will realize that gas lighting is still a "live" proposition.

It will also interest you to know that a record number—1870—of cooking and heating appliances were sold, and, needless to say, people who purchase appliances intend to use them.

The Company supply a very important area, and its proximity to the City of London gives it importance not only as a manufacturing and trading centre, but also as a residential area for those whose occupation makes it imperative for them to live near their business.

My predecessor reminded you last year of the keenness of competition from the local municipal electric undertakings, who were making strenuous efforts to extend their business. No objection can be taken to this, as healthy competition is good for both industries. We do, however, protest most strongly at our competitor being unfairly supported by Government Departments and municipal corporations.

FREE CHOICE DENIED COUNCIL HOUSE TENANTS.

In July of last year, during the debate on the Housing (No. 2) Bill in the House of Commons, an endeavour was made to obtain the insertion of a clause which would give the tenants of council houses the free choice of the form of light and heat to be used by them, but such was our legislators' idea of fair play and justice that the suggestion was received with derisive laughter. When such an attitude is taken at the home of the Mother of Parliaments, it is not surprising that local administrators are still further curtailing the liberty of the subject. The Stepney Borough Council have erected one block of 20 dwellings, and propose to erect 16 more blocks, comprising 346 dwellings, on the Limehouse Fields estate, and, with the consent of the Minister of Health, have made it a condition of tenancy of the dwellings so far erected that only electricity shall be used for lighting, heating, and cooking. The Company have protested to the council and to the Minister of Health against this prohibition, and have submitted figures showing that the cost to the tenants may be nearly three times the cost of gas for the same purposes, but, so far, without any satisfactory reply.

MUNICIPAL POLICY OF COMPULSION.

You will appreciate how serious the matter is when I tell you that the same municipal council has prepared a list of over 2600 houses in the borough which it proposes to demolish and replace by other houses, and if not checked it will, without doubt, continue the policy of compelling its tenants to use only electricity, in which event it is quite clear that the business which the Company has been encouraged by Parliament to carry on must suffer.

This municipal (and apparently Governmental) attitude of mind is strikingly changed from that of the late Mr. Will Crooks, who, though he represented Woolwich in Parliament

(and no man who sat upon its benches ever won to a greater degree the affection and regard of his colleagues there), resided in Poplar. He expressed the definite and forcible opinion that whether a man lived in Poplar or Park Lane he should be allowed to choose his own method of lighting. I remember that he told a little anecdote about his household which is perhaps worth repeating to-day. He said that his dwelling was lighted by electricity supplied by the Poplar Borough Council, but added that when his wife wished to do any sewing she always used a room lighted by incandescent gas.

Industrial Importance of Gas Undertakings.

Gas, ladies and gentlemen, has a long story of usefulness behind it during the century or more of its existence. It stands justified to-day as at once one of our important chemical industries and essential public utility organizations. It continues to be a large employer of labour, both at its own factories and at those where the plant and apparatus required are made, and many of these, like itself, are old-fashioned and honourably conducted undertakings. It seems an unfortunate thing that a Minister of State should be seized with the belief that all that vast structure of usefulness should be brought to the ground and scrapped, spreading financial ruin to many families and the spectre of unemployment to others, in order to make work by the uneconomic distribution of, and the supply of complicated apparatus for the use of, a form of energy which, as long as its source is coal and not the sun, cannot possibly become universal in its use unless economic considerations are totally disregarded.

Ladies and gentlemen, I have every faith in the future of gas if—and there is but one if—it is given in its use the fair play English people are entitled to expect, and certainly not less than from a Government, which claims to be actuated by the highest ideals of freedom, justice, and fair play.

Company's Co-Partnership Scheme.

Before I close I should like to make reference to the Company's co-partnership scheme. While this, with its forerunner—profit-sharing—has been in operation since 1901, at no time have its advantages been more generally recognized. Great keenness is displayed in the Company's affairs, and many suggestions are made for improving the business and working of the Company. No matter what position an employee holds, co-partnership brings home to him the necessity to do his best, and it is by the combination of individual effort that the successful working of the Company is obtained.

I now move that the report and accounts submitted be received, adopted, and entered on the minutes.

The Deputy-Chairman (Mr. Arthur M. Paddon, M.Inst.C.E.) formally seconded the resolution, which was carried unanimously without discussion.

Dividend and Re-Elections.

The Chairman then moved:

> That, pursuant to the recommendation of the Board of Directors, a dividend be declared for the half-year ended 31st December, 1930, at the rate of 6 per cent. per annum on the ordinary stock of the Company, *less* income-tax, payable on the 16th February, and that warrants for the same be forwarded by post to the proprietors.

The Deputy-Chairman seconded this, and it was agreed to.

On the proposition of the Chairman, seconded by Mr. Stanley H. Jones, M.Inst.C.E., the retiring Directors (Messrs. A. M. Paddon and B. R. Green) were re-elected.

The retiring Auditor (Mr. S. W. Savage) was also re-appointed.

Mr. W. G. Bradshaw's Services.

Mr. A. W. Rake then proposed the following resolution:

> The proprietors of the Commercial Gas Company present at this meeting have received with profound regret the news of the retirement of Mr. William Graham Bradshaw from the Chairmanship of the Company, and desire to place on record their appreciation of the exceptional services rendered by him during the forty-two years as Director, and the thirty-one years as Chairman, he was associated with the Company. They realize that the satisfactory position of the Company is largely due to Mr. Bradshaw's administration.

He did not think it was necessary to say anything further. He (Mr. Rake) had attended a great number of these meetings, and it had always been manifest to him that Mr. Bradshaw took a keen interest in the affairs of the Company. They would all miss him very much, and they wished him long life and much happiness in his retirement.

Mr. G. W. Ilsley, who seconded the resolution, said he also had attended the Company's meetings for well over thirty years, and he had been associated with the Company in another way. It had always been a very great pleasure to the proprietors to listen to Mr. Bradshaw's able addresses. He was sorry Mr. Bradshaw was not present on this occasion, so that they could personally thank him.

The Chairman said he need not tell them the resolution was a very pleasant one so far as the Board were concerned, and that they heartily associated themselves with everything that had been said.

The resolution was then put to the vote, and carried with applause.

Vote of Thanks.

Mr. J. Chamberlain proposed that the thanks of the meeting be given to the Chairman, Directors, officers, and employees generally. They could, he said, congratulate themselves as shareholders on the energetic way in which the Company's interests were looked after. With regard to what the Chairman had just said, he would remark that those who were forced to live in these Council houses were themselves not any more in love with the electric light than were others who had experienced the utility of gas. One man, in fact, told him he objected to having his house "lighted with red-hot hairpins." [Laughter.]

Mr. J. E. Warren seconded the vote, which was cordially passed.

The Chairman said that, on behalf of his colleagues and himself, he thanked the proprietors very much for this expression of their confidence. The very best manner in which the proprietors could show their appreciation, apart from this vote, was by doing all that they could to inform their friends and others with whom they might come in contact of the true state of affairs. He felt that people had no idea of the gross restrictions put upon the gas industry, and of the part played by the Government through the Minister of Transport.

Mr. F. J. Bradfield, responding on behalf of his department, said the Chairman had clearly indicated the difficulties with which the staff had had to contend. But they were all keen, and gave that support without which the Company's operations could not be successful. They were glad to know that the proprietors were satisfied, but whether they were as pleased with their own work was another matter. Frankly, he did not think that any man who was satisfied with his own work was worth his salt.

Mr. A. E. Williams, on behalf of the technical staff, also returned thanks, remarking that his colleagues appreciated as highly as he himself did this expression of the proprietors' confidence.

Another Record Year at Portsmouth

Another record year was reported at the Annual Meeting of the Portsmouth Gas Company on Feb. 12. Moving the adoption of the report and accounts, the Chairman (Mr. T. H. F. Lapthorn, J.P.) stated that during the year they had paid off £98,000 debenture stock issued ten years ago at 7 p.ct., and replaced it by an issue of £103,500 debenture stock at 5 p.ct. That would effect a saving of interest which might have been more if their 7 p.ct. debenture stock had fallen due for redemption six months later.

On the revenue account, the receipts from the sale of gas had gone up by £2651. They had sold more gas. The receipts from coke had increased by £5904, and those from tar were down by £3978. They had sold more tar, but the price fell three-fifths of a penny per gallon. The remainder of the residuals had not been satisfactory. Indeed, the market for sulphate of ammonia had been disastrous, largely due to the development of synthetic nitrogen processes, and he must confess that the future of the sulphate of ammonia market was most unpromising.

They had spent £3458 more on coal and oil, and although they had carbonized less, their coal had cost approximately 1s. 1d. per ton more. There was a fall of a farthing a gallon in the price of oil, and that would have been greater had the Company accepted a cheap offer of Russian oil, but they turned it down. Expenditure on repairs and maintenance of works and mains and services was down by £17,868, mainly due to the fact that there was a special item of expenditure in 1929 in connection with the holder at Rudmore which did not recur, while they had also overtaken the arrears of repairs and maintenance which they found confronting them when they took over Havant and Emsworth.

The balance at the credit of revenue account was £80,406, which was their trading profit for the year after setting aside £6658 for starting a renewals fund. That compared with a profit of £70,043 during 1929. The number of appliances in use had increased by 4095, and the number of consumers by 1908. Both at Havant and at Emsworth the sale of gas and appliances had maintained steady progress, the sale of gas at Emsworth having increased by 108 p.ct., and at Havant by 60 p.ct. since the Company took over those undertakings. Altogether, 1930 had created another record for the Company.

Ten Times the Electrical Output.

Mr. Lapthorn added that of 1325 gas undertakings throughout England and Wales, only 14 were selling gas at a fraction below the Portsmouth price, but if the automatic consumers were included the result was even more favourable to the Company. Making another comparison, he said that their sale of gas last year was equal to 349,151,758 Board of Trade electrical units, as against the sale by the Portsmouth Electricity Department for

the year ended March 31 last of 34,191,843 Board of Trade electrical units; so that the sale of gas last year in their district was just ten times the sale of electricity. On the same basis, their increase in the past ten years had been three-and-a-half times as much as their competitor.

The Chairman also referred to the fact that the Company were on the point of making a new issue of £80,000 consolidated stock, which would rank with the existing consolidated stock on which at present they paid 8 p.ct. Incidentally, their present capital was 6s. 9½d. per 1000 c.ft. of their output—one of the lowest figures in the country. The stock would be offered by tender at a minimum price of £123 per £100 stock, at which the yield to the buyer would be £6 10s. 1d. p.ct., but they hoped and expected to get more than that. The object of the issue was, first, to meet the continued expansion of their business, next to pay off a comparatively small overdraft at the bank, and, lastly, to pay off some of the money that they owed their superannuation and pension funds.

Regret was expressed by Mr. Lapthorn at the resignation, through ill-health, of Mr. H. A. Stibbs, who had held the Secretaryship of the Company for over twenty-five years, and he voiced the sincere good wishes of all for his complete restoration to health. In his place, they had welcomed Mr. R. W. Hewitt. Following upon Mr. Stibbs' retirement, they had added to Mr. Carmichael's responsibilities by making him General Manager, so that he now held the dual post of Engineer and General Manager. The Assistant Engineer, Mr. Whitehead, had become the Chief Engineer of the Southampton Company, and he had been succeeded by Mr. R. C. Taylor, B.Sc. The relations with the whole of the staff had been of the best.

The report and accounts were adopted, and a dividend was declared of 5 p.ct. on the 5 p.ct. maximum stock and 8 p.ct. on the consolidated stock, both *less* income-tax, leaving £45,025 to be carried forward.

The retiring Directors, Mr. Lapthorn and Councillor F. Beddow, D.Sc., were re-elected.

South Suburban Gas Company

ANNUAL GENERAL MEETING

The Annual Ordinary General Meeting of the proprietors of the South Suburban Gas Company was held at the Cannon Street Hotel, London, E.C., on Friday, Feb. 13—Dr. CHARLES CARPENTER, C.B.E., M.Inst.C.E. (Chairman of the Company), presiding.

Mr. WILFRID WASTELL, F.C.I.S. (Commercial Manager and Secretary), read the notice convening the meeting.

The minutes of the previous meeting were taken as read, and the Chairman sealed the Register of Proprietors.

THE CHAIRMAN'S ADDRESS.

Ladies and Gentlemen,—The satisfactory feature of the report is that there has been an increase, although only a slight one, in the sales of gas. In this respect the Company has been more fortunate than its neighbours who have not during the year overtaken the heavy demand experienced in 1929 when the winter was a hard and severe one. It is important to bear in mind these climatic conditions present during the comparable period; otherwise the large increase in consumers, and the small increase in consumption, would appear contradictory. The actual figures are 1¼ p.ct. increase in gas, and 6981 in the number of consumers. We have had, however, a busier time in the sale of gas-using appliances, and during the twelve months we have sold or hired some eleven thousand seven hundred pieces of apparatus. People do not hire or buy these articles unless they have the intention of using them for the purposes of gas consumption.

All this is to the good, but the cost of the new business has been heavy, as you will notice from the capital account which has increased by £116,236 during the year. This expenditure has been incurred mainly to provide the mains, meters, and stoves required by the rapid development of building operations in various parts of the district of supply. This is, however, not very compact, and it will take time before the unprofitable blank spaces which exist to-day are filled by gas-using houses. It is fortunate that our agreement with our neighbours, the South Metropolitan Company, relieves us of the need of additional capital expenditure in respect of gas manufacture. The expenditure in future will be as regards distribution and supply. I might mention that the gas purchased from them during the year was rather over three and one-third million therms. The balance of our expenditure under this head was mainly in regard to our programme of providing in each town or place of importance in our area a local office from which the consumers' requirements in respect of their supply of gas, and the apparatus for using the gas, can receive attention. We are in fact altering as far as possible and as quickly as possible in the direction of de-centralizing the selling side of our business making this as much as we can a more local matter, although the central organization at Sydenham will be the source from which all supplies will be taken. This denotes, you may consider, somewhat of a reaction from the policy of amalgamating the several undertakings which go to make up the Company as it exists to-day; but as you will see, while we manufacture and distribute in a wholesale manner, we sell in a retail way, and this is the fact we have continually to bear in mind in the case of our large area of scattered centres of consumption. I hope to be in a position this time next year to tell you of the completion of the plan and the results which the Board are confident will be achieved by it.

CHANGE OF CALORIFIC VALUE.

We changed over our calorific value from 500 to 560 B.Th.U. per cubic foot in the spring of last year. This at once increased our gas storage capacity in that ratio—viz., 50 to 56—as well as giving us relief by the increased carrying capacity of our mains, which is an important thing in the large area we have. Within ordinary limits of quality there does not appear to be the advantage that was at one time claimed in the manufacturing costs of the lower quality, and, on the other hand, the gain in distribution requirements is considerable. We are in fact reverting more nearly to a pre-war quality in the gas we send out to-day than at one time seemed profitable. And in this same category I must place benzole extraction. We consider that on the whole it pays to leave it in the gas and maintain what I may call "thermal concentration" in the quality of the gas, the cost of the distribution of which, though lower than other forms of energy, still figures largely in our accounts.

We have had, too, a busy year in gasholder extension and repairs. There has been erected at Greenhithe a completely new one holding the equivalent of 2800 therms. We have added a third lift to a two-lift holder at St. Mary Cray. We have also re-sheeted two lifts of the Sydenham holders, and carried out extensive repairs to two others. There are periods at which extensive repairs of this kind have to be undertaken, and, curiously enough, the quality of the material of which gasholders are made does not seem so lasting as was formerly the case. Some of the old iron holders erected half a century ago are to-day quite good, whereas some of the modern ones of half the age already require renewals. We have also given up, and I hope for good, the manufacture of water gas. Though this will necessitate a larger quantity of coke being marketed, we have devoted so much time and money to the improvement in the quality of this product that there should be no great difficulty in placing it when its new characteristics meet with more general recognition. These new characteristics include more uniform sizing. Each particular stove requires the appropriate size of coke to be burned in it. Another matter is the elimination as far as possible of shale and ash from the raw material we use.

ADVANTAGE FROM CENTRALIZATION.

While discussing technical matters, I must not omit to mention one great advantage we are getting from centralization, and that is in regard to our coal supplies. The control provided at Newcastle by the South Metropolitan Company, and in which we participate under the terms of agreement with them, has been of great assistance to our engineering staff in maintaining the quality and quantity of our output of gas.

Our change-over from the ordinary method to the one to which I have just referred with regard to coal purchases and maintenance of quality and output of gas was brought to a head sooner perhaps than would otherwise have been the case as the result of representation by our engineering staff. They found that trouble arose in their manufacturing operations from variation in quality of coal. It is not possible properly to differentiate between one coal and another merely by inspection. Therefore, the arrangements which have been some years in vogue with the South Metropolitan Company were included in the procedure for the supply of coal to this Company. There is a very complete organization at Newcastle specially created for this purpose. Its function is at least twofold. One task is the efficient sampling of cargoes of coal. It is not an easy thing to get a sample which is at the same time an average sample of the whole cargo, and yet of a kind which can be tested in the laboratory to ascertain definitely its quality for gas making, coke production, &c.

We are now able to make a test of a cargo being loaded at Newcastle, and before this cargo reaches the retort houses at Sydenham or Bromley the quality and quantity of gas that may be expected to be obtained from it are known at the London end. The knowledge thus gained has also been useful to colliery proprietors. We know perfectly well what we require in the way of quality, but it does not necessarily follow that the colliery people know. There are variations in the seams of a colliery. You may get one seam suitable for household purposes, another suitable for steam, and a third which is good gas coal.

A certain amount of knowledge was acquired by colliery owners as the result of reports received from time to time from people who used their coal, but owing to the organization which now exists at Newcastle the colliery owners know exactly which seams to allocate for gas purposes. Similarly, there are occasions when the quality of a particular seam varies, and owing to the control at Newcastle the colliery people can be at once informed of such change in quality.

Full Justification for Dividend.

Taking the year as a whole we have done rather more than pay our way, and we consider there is full justification in our results for the payment of dividend on the ordinary stock at the same rate as last year—namely, 6½ p.ct. per annum. The total of the amount of dividend above the basic rate of 5 p.ct. represents the shareholders' portion of surplus profits, and its payment carries with it the obligation to divide a similar amount between the employee co-partners. The total amount is £23,157, and under the allocation made by your Board £15,400 is distributed by way of bonus on salaries and wages and £7757 allocated to the superannuation fund.

A State-Aided Rival.

Speaking generally, we have had worse years than the past one, and we have also had better. We cannot expect to be free from the disturbances affecting all businesses by circumstances beyond their control. In the present instance some of the blame must be attributed to the weather, and some to our working with a rather narrow margin of profit. We could, however, sleep contented in our beds, to use the late Lord Fisher's expression for security, were it not for the fact that a cloud of unknown portent hangs over us as over the entire Gas Industry to-day. I allude, of course, to the remarkable and extraordinary attitude taken up by one of the Ministers of State in the matter of the sale of electric energy. The Gas Industry of this country is, as you know, partly in the hands of municipalities, and partly in the hands of companies like ourselves. There is, I think, little to choose between them as supplying a public need. There are progressive and healthy municipal gas undertakings as there are similarly constituted gas companies, but in both cases it must be borne in mind that they carry on their work under parliamentary authority and, indeed, with parliamentary approval. The undertakings have always had applied to them, as we have had, the designation of public utility organizations, and if any independent justification were needed for their continued existence I would point, as I have just done, to the fact that, although a large share of the country's requirements in the matter of gas supply is in municipal hands, no municipality has ever desired to get rid of its responsibilities in this respect. On the contrary, the gas undertaking has been invariably indicated as constituting one of the outstanding examples of what can be done under municipal control.

Municipalities sought in the first instance these responsibilities; they raised loans to buy out the original owners, and they have extended their acquisitions and carried them on. Such being the case, I think we are bound to accept this evidence as confirming what I have stated—that gas undertakings have always been regarded, and still are, by the general public as necessary orgnaizations providing an unquestioned everyday requirement. Parliament has never discussed nor, I suggest, visualized the extermination of gas undertakings. It has always regarded them as having a permanence similar to water-works, railways, harbours, and so forth. And with this in mind it has hedged round their financial activities with all kinds of restrictions in regard to the amount of capital they can raise, how they can raise it, the interest to be allowed upon it, and so on; and if any one undertaking appeared to exhibit signs of more than the average prosperity, it was pretty certain to have its wings clipped a little when it went again before Parliament for an extension of its powers.

The evidence of the last fifty years has shown that there is an important field of usefulness which the Gas Industry can occupy, notwithstanding the competition of its more fashionable rival, electricity. If the choice of use is left to the public's unfettered judgment I have no fear whatever of the result. There are many directions in which it is absolutely impossible for electricity to compete with gaseous energy, unless economic considerations are totally disregarded. The fact that the Minister of Transport has advertised that he lives in what is described as an "all-electric" house (although on Sunday evenings in the winter it becomes necessary to burn raw coal in order to get comfortable) is entirely his own affair and no one has ever suggested the contrary. I do, however, protest against his official advocacy as a means of relieving industrial distress—the conversion of all domestic dwellings from which gas is to be completely excluded.

It is all very well to talk of the great Gas Industry, and of there being room for both. Our demand is:

"Let the public have their choice; do not bolster up one against the other. Allow the public which they prefer." But it is all nonsense to talk about there being room for both.

In France the economic distribution of gas is being encouraged and expanded, and this is also true in Germany—I speak of these cases from my own knowledge. In America, recently visited by a colleague of mine upon the Board of another Company, progress in this direction is enormous, notwithstanding the way in which that country is cited when statistics are required in support of the electric grid. Only in England, I believe, would it be possible to put forward such a scheme as that of which the Minister of Transport is the putative parent. A similarly placed Minister in any other country would long ago have been warned by his colleagues or his advisers that the path he was pursuing was an economically impossible one.

Municipal Tyranny.

In his speech to the Electrical Engineers last night, the Minister did indeed disclaim that neither he nor the Government had any idea of doing harm to the Gas Industry. But you have seen references in the Press to what is happening in various places, where the use of gas is being prohibited by municipalities. You have learned that there are no less than 100,000 municipally-owned houses the tenants of which are prohibited from using gas. The Minister suggests that this action is not one for which the Government has been responsible, but the fact does remain that last year there was an endeavour made to put an embargo on this attitude of the municipal authorities. The idea was that as these houses were erected largely by means of public money, the tenants should be left free to choose which source of light and heat they preferred. Well, the Government put on the Whips, and that proposal was defeated. This fact provides the best answer to the claim that there is no intention on the part of the Government of doing harm to the Gas Industry. They put on the Whips for the specific purpose of defeating the proposal that freedom of choice to use gas should be given to the tenants of these dwellings.

You can, of course, destroy any product of civilization if you have money and means. If the Government is so disposed it can crush the Gas Industry out of existence, and that is the logical effect of the propaganda recently carried on from Glasgow to London. Who would imagine that any municipality would commit such an act of sabotage as to fill up with liquid cement the gas pipes in houses of which they were owners so as to prevent their tenants enjoying the source of light or heat they preferred?

The Gas Industry can look back with pride to the beginning of the nineteenth century, where it, like the iron road and the iron steamship, started on its civilizing career. I sometimes wonder whether this advocate of doing everything electrically, from "preparing the morning cup of tea while in bed," ever realizes that it is the gas engine and not the electric motor that has solved the problem of road traction to-day. When electricity takes the place of the gas engine for this purpose, there may be some likelihood of its general use for boiling the kettle, cooking the joint, and warming the living room economically. But that time is not yet.

Fair Play Wanted.

The Gas Industry asks but one thing—a fair deal. It asks that every member of the public, wherever he lives and whoever's house he occupies, may have free choice as to how he may light it, cook in it, warm it; in fact, how he may occupy it. In my opinion the man who uses a raw coal fire in seasons of fog is doing a greater disservice to the community than one who uses gas, and if we are to have clean, healthy cities that is the direction in which governmental encouragement should be given. With regard to the assertion that it is more troublesome to keep ceilings clean with gas than when electricity is used, it is the dust in the air which is the origin of the so-called effects of gas. The late Dr. Richard Garnett put the matter very tersely when he pointed out the part played by the whitewashed ceiling. He said that it absorbed dust and dirt which would otherwise be absorbed by the lungs of the occupants of the room, and he added: "You can whitewash the ceiling when you wish, but you cannot whitewash your lungs; and so it is better to have that dust on the ceiling than in your lungs where you cannot get at it."

Before I sit down I should like to refer to the continuance of our happy relationship with our employees during the somewhat anxious times through which we are passing. I believe they have a sympathetic understanding of our difficulties, and it is of great assistance to us to feel they are actuated by similar desires to ourselves in providing the public with one of the necessities of life at a fair and reasonable cost.

I will now conclude by formally moving:

> "That the report of the Directors, and the accounts examined and signed by the Auditors, be received, adopted, and the report entered upon the minutes."

The Deputy-Chairman (Mr. Benjamin R. Green) seconded this resolution.

Mr. H. K. Scott asked whether the arrangement made between the Company and the South Metropolitan Company had resulted in substantial benefit to the South Suburban Company. He had been very much interested in the Chairman's righteous indignation about what had been referred to as the boosting of electricity, and he thought that this righteous indignation was thoroughly justified. It had occurred to him, however, to wonder if the Directors had tried to make the authorities understand, "across a table," that their procedure was open to very serious criticism. The sampling of coal described by the Chairman was a step in the right direction, not only from the point of view of the Gas Industry, but also from the national point of view. The present year was young, and the winter had been a mild one, and he would like to know what were the prospects in the matter of gas consumption. Did this boosting of electricity prejudice their Company to the same extent as had happened in some other places?

The Chairman replied that the increased output of gas to date, compared with the corresponding period of 1930, was a little over 11 p.ct. They had tried to arrive at some understanding with the municipal authorities, but found it exceed-

ingly difficult. In one case he personally did his best to secure freedom of choice in the case of a housing estate. He said to the man responsible: "All we ask is the privilege of placing our pipes in the houses you are building." He was not sure that the man was unsympathetic, but the man's difficulty was that the electrical people said: "We will have nothing whatever to do with that estate unless you exclude gas from it." This was a good example of the difficulties they were up against. Electrical undertakings were coming face to face with the inevitable troubles which must arise with an all-electric installation on anything like a big scale. It was necessary to put so much copper under ground to provide for the peak load on Sunday morning that it did not pay to have it lying idle for the remainder of the week. As to the advantages to the South Suburban Company of their association with the South Metropolitan Company, he thought there was no doubt whatever about them, and he was quite sure that as time went on these advantages would become more and more apparent. The coal sampling organization at Newcastle, to which he had referred, was an extremely important advantage. In addition to this they had the benefit of association with the Research Department of the South Metropolitan Company, and, of course, there was the benefit of co-operation in other ways. Each was enabled to take full advantage of the other's experiences.

The resolution for the adoption of the report and accounts was then put to the meeting, and carried unanimously.

Dividends.

The Chairman next moved the following resolution:

> That a dividend for the half-year ended Dec. 31 last be now declared at the following rate per annum—viz.: 6½ p.ct. on the ordinary stock, *less* income-tax; and that warrants for the net amounts be forwarded on the 26th inst. to the registered addresses of the proprietors.

The Deputy-Chairman seconded this, and it was agreed to.

Re-Elections.

The Deputy-Chairman proposed the re-election as Directors of the Company of Dr. Charles Carpenter and Mr. Frank H. Jones, M.Inst.C.E. These two names, he said, were probably more widely known than any others associated with the Gas Industry. No body of proprietors could be more appreciative of their outstanding qualities than were the proprietors of the South Suburban Gas Company.

Mr. C. J. Carter seconded the resolution, which was carried with applause.

The Chairman and Mr. Frank H. Jones expressed their thanks.

The retiring Auditor (Mr. Ernest D. Davey) was re-appointed, on the proposition of Mr. Ernest A. Pierce, seconded by Mr. Clifford Hunt.

Vote of Thanks.

Mr. John Randall proposed that the hearty thanks of the meeting be given to the Chairman, Directors, officers, and workpeople for their excellent services during the past year; and the vote was passed by acclamation.

The Chairman briefly acknowledged the compliment on behalf of his colleagues and himself.

Mr. Wilfrid Wastell said it was once more his privilege to be allowed to act as the mouthpiece of the members of the staff and the workpeople under his charge, in thanking the proprietors for this kind acknowledgment of their services. He sometimes thought the thanks should be on the other side. They were all proud of their Company, and were happy to serve a Board of Directors who had a sympathetic understanding of their difficulties. They were fortunate indeed in owing allegiance to Dr. Carpenter as Chairman, because, although he set such a high standard of service, he was "to their faults a little blind, and to their virtues very kind."

Mr. John Terrace, M.Inst.C.E. (Chief Engineer), thanked the proprietors on behalf of the engineering staff and the people in his department. While in many cases the general meeting of a gas company was looked upon as a purely formal affair, it was never so with the South Suburban Company. The proprietors would probably be surprised to learn how greatly the employees appreciated a vote of thanks coming from them. All connected with the Company really did their utmost to serve the Undertaking to the best of their ability, and having done this, and being human, they did like to hear that their services had been appreciated.

Croydon Gas Company

ANNUAL GENERAL MEETING

The Annual Ordinary General Meeting of the Croydon Gas Company was held at the Company's Offices, Katharine Street, Croydon, on Friday, Feb. 13. Mr. William Cash (Chairman of the Company) presided.

The formal business having been transacted,

The Chairman moved the adoption of the report and accounts for the year ended Dec. 31, 1930, which showed a balance of £85,759 4s. 11d. available for dividends.

In the first place, the Chairman paid a tribute to the late Mr. Percy Hedley Hall (a Director), who had died during the year, and voiced the Board's sense of the great loss the Company had suffered thereby. The Chairman added that the election of his son (Mr. William Cash, Junr.) to fill the vacancy was a source of great pride and gratification to himself, and he regarded it as a compliment that the suggestion to elect his son had come from his colleagues. His son's claim for consideration was his connection with the gas industry; he was Secretary of four gas undertakings, and Auditor of several others, including the Tottenham Gas Company, the British Gas Light Company, the Dublin Consumers' Gas Company, and many others.

Increased Sales of Gas.

Coming to the report, he said that the increase of gas sales in 1930 over the 1929 sales was 0·32 p.ct., or 9,482,700 c.ft. That increase might appear to be very small, but he pointed out that 1929 was an abnormal year in regard to gas sales. If the two years 1929 and 1930 were taken together and compared with 1928, the increase over 1928 was more than 6½ p.ct., or (say) 3½ p.ct. compound on the two years. He recalled that in February, 1929, the weather was extraordinarily cold. During the first three months of 1929 the sales of gas by the Company represented an increase of 17½ p.ct., and in the first half of 1929 the increase was 11½ p.ct., as compared with the corresponding periods in 1928. Bearing those facts in mind, there was no reason for concern because there was not so large a percentage increase in 1930 as the Company had become accustomed to.

The Board had decided, he continued, to install further coal gas plant, for use in the winter of 1932-33, the present capacity of the works being about 17½ million c.ft. per day. During the past year the Company had taken on 3190 new consumers, so that the total number of consumers on the books had increased to nearly 77,000. During the past year also the showrooms had sold fittings and appliances to the extent of nearly £80,000, the number of fittings and appliances sold being 11,630. It must be borne in mind that appliances were becoming more and more efficient, and the volume of gas consumed by them was less than was consumed by the older and less efficient apparatus. During the year there had been a net addition of 20 miles of mains, after allowing for some 5 miles re-laid or abandoned.

New Carburetted Water Gas Plants.

After a reference to the new showrooms at Wallington, housed in a really beautiful building, he said the Company had installed two new automatic carburetted water gas plants to replace two hand-operated plants, which were abolished. The coke handling plant had been added to, and a well had been sunk, so that the Company had its own supply of water, and would save a considerable sum of money thereby. The new vertical retorts—the first verticals the Company had installed—were giving results which were improving month by month, the wages bill had been substantially reduced as anticipated, and from the point of view of wear and tear the new retorts compared favourably with the old horizontals. Further, the Company's Engineer had installed waste-heat boilers, which had halved the cost of fuel to boilers, and the costs of light, heat, and power were also reduced.

Success of Capital Issue.

With regard to Capital Account, there had been an issue during the year of debenture stocks, which had realized the satisfactory net price of £97¾ p.ct., and at the date of the meeting the value of the stock was substantially higher than that. Investors were apparently satisfied to put their money into the Croydon Gas Company.

Discussing the Revenue Account, he pointed out that the amount received for the sale of gas was decreased, due to a reduction of price, which had benefited the consumers to the extent of almost exactly £12,000. The receipts from coke were increased—an eminently satisfactory feature—and receipts from tar were rather better, which was somewhat astonishing; but he was afraid that the outlook with regard to tar was not good. For the first time in the Company's history, sulphate of ammonia showed a loss, due to the large production of synthetic ammonia and the drop of world prices. Carbonizing wages were less, for reasons he had given, and the profit for the period was very slightly less than in the previous period.

With regard to the Net Revenue Account, debenture interest was increased by some £5000, due to the issue of new stock; other interest was increased by £500; and income-tax was rather less than in the previous year.

The Company had again put £10,000 to the Pension Fund, and had again put £10,000 to Renewal Fund, and the carry-forward

was increased by £8147. Only £984 was placed to Reserve Fund, as compared with £7000 in 1929. This was due to the fact that the standard price had been revised, and the Company had placed the maximum amount permissible to the fund, in view of the present price of gas and the present dividend.

It was very satisfactory that the Pension Fund had passed the quarter-of-a-million mark, and continued to grow steadily. A very large proportion of it was invested in outside securities. As to investments, at Dec. 31 the Pension Fund showed a surplus of market value over book value of about £2000, the reserve investments were worth £5500 more than the figure in the balance-sheet, and the value of the Insurance Fund was more by £2700.

Future Prospects of the Gas Industry.

Discussing the prospects of the gas industry generally, he commented that the development of the electrical industry seemed to be causing a certain amount of uneasiness in some people's minds; but it did not in his. He was still a believer in the future prosperity of the gas industry, and asked only for a fair field and no favour. If electricity possessed the wonderful potentialities claimed for it, it appeared that it should not require so much encouragement or political backing as it seemed to secure. Very large sums were being poured into the industry to provide for those costly schemes which were continually being referred to in public, and the industry would have to provide a return on that capital as it came into use. Looking at matters from the national point of view, there could be no advantage if attempts were to be made to filch from the gas industry business which it could continue properly to fulfil in the future, as it had done in the past. His belief was that there was ample room for both, each in its own sphere; but the gas industry did labour under certain disadvantages. It ought not to be hampered by old or obsolete legislation, which did not give it facilities for development equal to those enjoyed by the electrical industry. For example, the methods of charge were much more strict and much more difficult to fulfil in the gas industry than in the electrical industry.

The Question of Amalgamation.

After emphasizing that the industry could develop by the amalgamation of small units with large undertakings or by working arrangements of mutual advantage, he referred to the Company's recent proposals to take over the East Surrey Gas Company and the Oxted and Limpsfield Gas Company, as the results of which the Croydon Company was to acquire the Oxted and Limpsfield Company only. The Croydon Company, he said, had been satisfied that by its scheme advantages would accrue to the consumers, workpeople, and shareholders in all the areas sought to be amalgamated. The shareholders of all three Companies had approved the proposed terms, but at the subsequent Board of Trade inquiry the Reigate local authorities had objected, and the Board of Trade had declined to sanction the amalgamation so far as the East Surrey Company was concerned. The two reasons given officially were that the price to be paid to the East Surrey Company shareholders, and the compensation to officials, were too high. These terms were the lowest that could be obtained, after long and earnest negotiation, and the Board were satisfied that on those terms they would not be throwing a burden on the Croydon Company which would not be met by the profits it would receive from the East Surrey Company, so that the terms could be justified. Similar remarks applied to the compensation proposals, and there were numerous precedents for payment of compensation on the lines proposed. The Directors were, of course, disappointed with this result; it was not helpful in considering other like proposals in the industry. Vendors in future would have to be sure that a purchase price could be fully justified from every point of view; but, equally, local authorities should not press their opposition to a point that might prevent an ultimate public benefit being accomplished, having also in mind that if a public benefit were to be conferred it should not be carried out regardless of injury or hardship to individuals affected. However, the failure to take over the East Surrey Company was not a disaster, and the Croydon Company's prospects were bright. Moreover, the Oxted district was of a good class, capable of great expansion, and the Company could give the consumers there a satisfactory service on lines which it had been beyond the powers of the Oxted Company to give.

The resolution for the adoption of the Report and Accounts was seconded by Mr. Thomas Rigby (Deputy-Chairman).

A shareholder asked if there would be a fresh issue for taking over the Oxted Company. The Chairman replied that there would not be, because Croydon stock would be issued to the Oxted shareholders direct in payment.

The Report and Accounts were adopted unanimously.

Dividends.

The Chairman proposed:

> "That dividends at the following rates per annum for the half-year ended Dec. 31, 1930—viz.:
>
> 7½ p.ct. on £120,000 Redeemable Preference Stock,
> 5 p.ct. on £453,100 Maximum Dividend Stock, and
> 7 p.ct. on £787,560 Sliding Scale Stock,
>
> making, with the interim dividends declared by the Directors and paid on Sept. 1, 1930, dividends for the year at the respective rates of 7½, 5, and 7 p.ct., be now declared and payable on March 2, 1931."

Mr. Henry Woodall seconded, and, as a gas engineer, commented on the excellence of the Company's works, which were well designed and well maintained. He added that the guarantees of the contractors in respect of the water gas and coal gas plants recently installed had been exceeded in all cases.

The resolution was carried unanimously.

Re-Election of Retiring Directors.

Mr. Charles Hussey, J.P. (who has been a Director of the Company for 41 years, for 32 of which he served as Chairman), and Mr. Harold Williams, O.B.E., F.S.I., having retired by rotation, were unanimously re-elected to the Board.

Re-Election of Auditor.

Lieut.-Col. W. C. Smith, D.S.O., M.C., F.C.A. (the Auditor who retired by rotation), was unanimously re-elected an Auditor of the Company.

Votes of Thanks.

On the motion of the Chairman, seconded by Mr. R. A. Barham (a shareholder), a hearty vote of thanks was accorded the officers, staff, and workpeople, on whose behalf Mr. Wm. J. Sandeman (General Manager) responded.

On the motion of Mr. R. A. Barham, seconded by Mr. M. J. Taylor, a vote of thanks was also accorded the Directors. The Chairman briefly responded.

The meeting then closed.

Cardiff Gas Light and Coke Company.

Large Output of Appliances.

The Annual Ordinary Meeting of the proprietors of the Cardiff Gas Light and Coke Company was held at the Gas Offices, Bute Terrace, Cardiff, on Thursday, Feb. 12.—the Chairman of Directors (Mr. Lawrence G. Williams) presiding, supported by Mr. Robert H. Williams (Deputy-Chairman), Mr. James Miles, Mr. A. E. Prosser, Mr. William Ware, and Mr. Bertrand Turnbull, Directors.

The Secretary (Mr. Robert J. Auckland) read the notice convening the meeting.

The Chairman, in submitting the Directors' report and annual statement of accounts, said: You will require no apology from me in presenting a statement of the financial position of the Company, which shows that on the year's working we have increased substantially the carry forward of our net revenue account in time of great difficulty at the close of a year which has been commonly agreed to be one of the worst in general experience. The figures attained are the result of very careful and energetic marketing in the face of great difficulty. Foreign competition of materials for road making purposes has continued to be exceedingly severe, despite the excellent propaganda of the British Road Tar Association and the many other efforts made to induce the British public to use British productions in preference to those imported from elsewhere.

Sales of coke have been fairly well maintained, and, indeed, the use of this fuel shows signs of becoming increasingly popular. We have during the past year and for several years past disposed of a large number of up-to-date modern and efficient gas consuming appliances, including cookers, gas fires, wash-boilers, and water heaters, as well as furnaces and other industrial appliances.

Furthermore, we have made the supply of fittings more elastic by increasing the numbers issued to any consumer, and a satisfactory consumption is obtained as a consequence.

The total number of consumers has increased by 1055, notwithstanding the fact that building operations within our area of supply have been considerably reduced and are practically at a standstill.

Offer of Bulk Supply.

I think it only right to mention that a neighbouring town is proposing to erect at considerable expense a new gas manufacturing plant, and that your Directors have taken the opportunity of offering to supply them with a bulk supply of gas subject to certain safeguards and conditions. The matter is at present in a very early stage, and I do not think I can say anything more than that the terms to be offered will receive the most careful consideration with a view to the mutual interests of the undertaking in question and of your own Company.

I now move that the Directors' report and audited statement of accounts be received and adopted.

Mr. Robert H. Williams seconded, and the proposition was unanimously carried, after which dividends at 6 p.ct. per annum on the ordinary stock and 4½ p.ct. per annum on the preference stock were declared.

York Gas Company's Progress.

Satisfactory Year Despite the Depression.

Despite general trade depression, a satisfactory year's progress was reported at the Annual Meeting of the stockholders of York Gas Company, held at the Gas Offices in Davygate, on Feb. 12. Mr. ALFRED PROCTER (Chairman of Directors) presided.

The CHAIRMAN, moving that the report and accounts be received and adopted, said: The year 1930 has been unfortunate in two main respects. The general and severe trade and industrial depression has undoubtedly had its effect on the purchasing power of the community, and has been felt in York as elsewhere. And the exceptionally mild weather conditions in the early part of the year had an effect on consumption. The quantity of gas consumed has been practically stationary, there having been the very slight decrease of 0·17 p.ct., and in view of the adverse conditions we consider this to be very satisfactory. It is reassuring to be able to say that so far as this year 1931 has gone the consumption is recovering its normal growth.

The main item of revenue is the receipts for gas sold, which shows a decrease of £4193, but this is a matter for which we claim credit, because it arises in consequence of the reduction in gas accounts by the new scale of discounts, and therefore represents a gift of £4193 to our consumers. Of course, it is the main purpose of our policy to cheapen as well as improve the service of gas, and to that end we have always pursued a policy of conserving our financial resources and steadily improving and modernizing our plant and equipment.

SALE OF RESIDUALS.

The sale of residuals has again been a serious drawback in our finances, and shows a decrease of £2622. This is a matter beyond our control, and unhappily there is no indication of any possibility of improvement in the markets for tar and ammonia.

On the side of expenditure, we show a decrease in manufacture and maintenance of plant of £3015, but an increase in distribution of £4775. This latter item is mainly accounted for by the provision of new and improved cookers for the slot meter consumers which we have reason to believe have been very much appreciated. The decrease in maintenance has occurred mainly because we have not found it necessary to do so much work in renewing mains and other works of renewal and repair during the year. The total expenditure is less by £6423 than in the previous year, and the result is a balance of profit of £17,688, being a decrease of £505.

The VICE-CHAIRMAN (Sir John Joseph Hunt, J.P., C.C.), seconding, said the Chairman had put before the stockholders the position of the Company in a splendid way. He felt it must be gratifying to them to know that they were in such a satisfactory position at the present moment.

The proposal was carried.

The CHAIRMAN moved that dividends at the rate of 4 p.ct. per annum upon the "A" preference stock, and at the rate of 5 p.ct. per annum upon the consolidated ordinary stock be now declared for the year ended Dec. 31 last.

The CHAIRMAN moved the re-election of Mr. Cecil B. Johnson, Mr. Thomas C. Horner, J.P., and Col. Harold H. Wilberforce, D.S.O., as Directors of the Company, and the VICE-CHAIRMAN, seconding, said the three retiring Directors had given great service with their ability and time to the Board.

Record Gas Sales in Bristol.

Domestic and Industrial Demand Increases.

Sir GEORGE E. DAVIES, the Chairman of the Bristol Gas Company, presided at the Annual Meeting on Feb. 12, and in his speech said: It is most gratifying to be able to report a further record in gas output; and sales for the past year—in spite of the exceptionally mild weather conditions in the spring—show an increase of 30 million c.ft. over 1929, in which year we had up to then a record output. It is interesting to note, in this connection, that over 60 p.ct. of the gas sold is used in daylight hours—which is an indication of its extended use for industrial and domestic requirements. The number of consumers in the district is now 101,634, an increase during the year of 3746. The number of cookers issued on hire by the Company up to Dec. 31, 1930, was 90,562, while a very large number of cookers have been sold direct. It is estimated that there are over 100,000 gas cookers in use in the city.

These increases for the past year are a continuance of the progress in recent years. In the past ten years the number of consumers has increased by 29,487, and the number of hired cookers by 28,944. Practically all new consumers have adopted gas for cooking, and over 90 p.ct. of the cooking in Bristol is done by gas.

Prepayment customers are increasing, and now represent 53 p.ct. of the total number of consumers, and 35½ p.ct. of the total gas sales; while the amount collected from slot meters during the year was £259,205.

We have now in use 494 miles of mains and 356 miles of service pipes—an increase of 74 miles of main and 46 miles of service pipes during the past five years; while in the past 20 years the number of customers per mile of main has increased from 154 to 206.

The series of public lectures and practical demonstrations in various parts of the city, arranged by the Company during the year, have been an outstanding success, as 45,000 people have visited the exhibitions, and 6000 have attended the lectures.

Turning now to the accounts, it will be seen that the receipts for gas were £582,174, against £577,351 for the previous year. Cooker and meter rentals increased from £73,717 to £75,909. Residuals produced £137,696, against £135,484, and the importance of the receipts from residuals is shown by the fact that last year we sold over 93,000 tons of coke and breeze for domestic and industrial purposes; 2½ million gallons of tar, which was mostly utilized in the production of road tar and used for improving the road surfaces in the counties of Gloucester, Somerset, and Wiltshire; and 6 million gallons of ammoniacal liquor, used for producing sulphate of ammonia and utilized in the agricultural areas as a fertilizer. The revenue profit for the year was £100,233, against £93,312 the previous year.

Alderman J. FULLER EBERLE (Deputy-Chairman) seconded the resolution for the adoption of the report and accounts, which was carried.

The CHAIRMAN next proposed:

> "That a dividend for the half-year ended Dec. 31 last, at the rate of £5 p.ct. per annum, on the nominal capital of the Company entitled to dividend, be declared."

Major CADBURY seconded the resolution, which was carried.

Gas Company Results in 1930.

Altrincham.

The Directors of the Altrincham Gas Company submit the following report for the year 1930. The profit shown by the revenue account is £14,466. The balance shown by the profit and loss account as available for dividend is £7105, which will provide for payment of the full statutory dividends, *less* income-tax, and leave a balance of £3430 to be carried forward. The sale of gas shows an increase on the previous year of 1,188,500 c.ft. Owing to the extra cost of coal and the increased rates assessment it was found necessary to raise the price of gas ½d. per therm as from the meter readings for September quarter.

Fleetwood.

The half-yearly report of Fleetwood Gas Company shows a profit of £2155, reduced in the profit and loss account by debenture and temporary loan interest to £1462. The Directors recommend 7½ p.ct. dividend on preference stock, 7 p.ct. on the ordinary stock, leaving a balance of £49 to carry forward.

Maidstone.

The accounts of the Maidstone Gas Company for the half-year show that after providing for all fixed charges (including £1000 for depreciation of stoves and fittings and £915 for renewal fund) there remains an available balance of £11,032, which, together with the balance of £12,716 brought forward from the previous half-year, and £118 interest on investments, makes a total of £23,887. The sum of £1140 has been transferred to reserve fund, bringing the total of that fund up to £17,827. After providing for income-tax, interest on debenture stock and deposits, there remains a balance of £19,009, out of which the Directors recommend payment of a dividend of 4½ p.ct. for the half-year. Although the Company have been faced with an increase in the price of coal during the last half-year, the price of gas has remained unchanged. The revenue from residual products shows a slight increase over the corresponding period of 1929.

Malton.

The Directors of the Malton Gas Company present the report for the past half-year which shows that the Company have earned during that period on trading account a profit of £2265, against £2227 for the corresponding period last year. This must be considered very satisfactory in view of general conditions, and particularly as the cost of coal has been considerably more than 12 months ago. While the consumption of gas is slightly higher, the receipts from coke, asphalting, and fittings, all show substantial increases, especially fittings, which have established a record during the past half-year. After paying income-tax and interest on mortgage bonds, there is a balance of £5371 (including £3487 brought in from the last account) available for the payment of dividends. The Directors recommend that a dividend of 6½ p.ct. free of income-tax be paid for the half-year, which will absorb £1500, and leave £3871 to be carried to the next account.

Overseas Opportunities.

[From the Board of Trade Journal.]

Canada.

Gas Pipes.—A firm of merchants in Calgary, Alberta, are desirous of being placed in touch with British manufacturers of gas pipes, valves, fittings, and equipment for gas pumping stations for use in the supply of natural gas from distant oilfields to the cities in Saskatchewan and Alberta. Firms in a position to offer raw material of British manufacture can obtain further particulars on application to the Department of Overseas Trade, 35, Old Queen Street, S.W. 1. (Ref. G.X. 10061.)

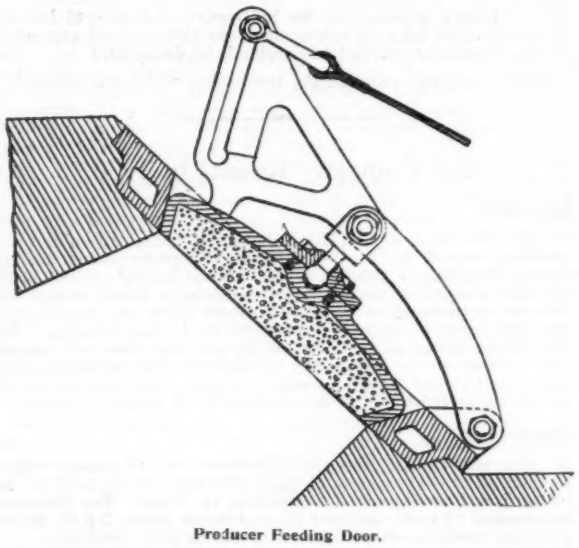
REGISTER OF PATENTS

Producer, &c., Feeding Doors.—No. 340,285.

THE GAS LIGHT AND COKE COMPANY and THORMAN, J. S., both of Horseferry Road, Westminster.

No. 28,963; Sept. 24, 1929.

This invention relates to feeding lids or doors for furnaces, gas retorts, coke ovens, and gas producers, and has for its object to provide an improved construction which facilitates feeding the producer or analogous plant and which requires less time and less labour in operating it than do existing lids.



Producer Feeding Door.

A balanced lid is universally suspended from a lever operable by flexible raising and lowering means and hingedly interconnected to a fixed part of the associated structure, the lever being provided with means which constantly maintain the door always in the same position relatively to the lever during the engagement of the lid with an aperture which it is desired to close, as well as during the disengaging movement of the door from the aperture. The door is of truncated conical hollow form either built up in parts or solid, and is carried by a ball joint suspension pivotally attached to a lever adapted to be raised and lowered by suitable flexible means such as a wire rope or chain, which is attached to the lever. The door is adapted to co-operate with a seating frame, the bore of which corresponds to the external form of the door. The seating frame is provided with a flange adapted to rest on any structure to which the frame is applied, the frame being firmly secured to the structure.

The seating frame, which may be solid, is constructed with an annular cavity provided with an inlet and outlet, so that air, steam, or water may flow round it. The outer face of the door is of convex curvature and is provided with a recess adapted to receive the globular end of a connecting link which is forked at its opposite end for attachment to a manipulating lever. The globular end is retained in the correspondingly shaped recess in the door by a cover plate formed in one or more than one part and recessed on the underside, this plate being secured to the door by set screws or other means. The door also carries diametrically and oppositely disposed lugs having undercut recesses to receive the ends of a tee-handled tool or key which enables the door to be moved freely in all directions, so that the door can be thoroughly seated in its framing, thereby providing a gas-tight joint. The framing with which the door co-operates may be solid or constructed with an annular space through which air, steam, or water may flow and thereby preserve the seating frame from the effects of the heat to which it may be subjected. The framing is provided on one side with lugs between which the suspension lever is pivotally supported, the connecting link being pivotally secured to the suspension lever. The latter is somewhat of an L-shape, being broader at its free end than at its pivotal end. The outer or free end of the suspension lever is slotted, and in the slot is attached a link to which a wire or chain may be secured. The slot in the suspension lever permits of the leverage needed to open the door being varied to suit the required conditions. The inner end of the suspension lever adjacent to the inner end of the slot therein is provided with a stop which not only acts to guide the door into its seating, but also prevents the door from assuming an awkward position relatively to its seating. The hollow space in the truncated door may be fitted with a solid insulating block. The wire rope passes over pulleys, and is provided at its free end with a counter-weight.

Open Flame Gas Radiators.—No. 340,499.

WORTLEY, G. W., of Falkirk, Scotland, and MAIN, R. & A., LTD., of Grosvenor Gardens, S.W. 1.

No. 29,611; Sept. 30, 1929.

According to this invention, an "open flame" gas radiator is characterized in that the tubes are supported solely by an apertured plate or ledge which engages the lower extremity of each tube, and in that the loop is provided with a removable top cover. The purpose of this arrangement is to provide means whereby the tubes may be removed after detaching a single part—namely, the cover plate.

A feature of the invention consists in that the apertured plate or ledge is removably mounted at the top of the gas burner chamber. Preferably a removable cover plate is secured across an opening in front of the gas burner chamber, at least a part of which opening extends across the breadth of the loop to an extent sufficient to permit of the passage of the apertured plate or ledge therethrough, which plate is so mounted in slides at the top of the chamber that it may be slid out through the opening.

The removable cover plate is provided with a hinged door which enables access to be obtained to the burners while the remainder of the cover plate obscures the opening through which the removal of the apertured plate or ledge is effected. A number of apertured plates may be provided, each of which is arranged to support and locate two tubes. A still further feature of the invention consists in arranging the burners upon a supply pipe which is pivoted to swing in a horizontal plane about an axis of pivoting so correlated with the opening in the chamber that all the burners may be swung outside the burner chamber without the necessity of forming a slot in the edge of the opening.

Waterless Gasholders.—No. 340,898.

MASCHINENFABRIK AUGSBURG-NURNBERG A.G., of Nürnberg.

No. 11,313; April 9, 1930. Convention date, April 24, 1929.

It has been proposed, to avoid disturbances in the circulation of the sealing liquid in holders of the disc type with liquid seal, to heat the contents of the bottom cup so that, also in the case of severe frost, the discharge openings to the tar collecting containers should not become blocked up by the thickening of the tar or by the deposition of ice. This invention has for its object an arrangement to solve this problem in a simple manner.

According to the invention, in the proximity of the openings through which the contents of the bottom cup flow to the collecting and purifying containers, coils of tubes are arranged through which preheated sealing liquid is forced to circulate. This heating means is available in the collecting containers, which are heated in a known manner, for the heating of the sealing liquid, and is conveyed in a simple manner by the tar-collecting pumps which normally force the sealing liquid up to the gas container after they have been correspondingly switched over. Consequently the use of separate heating means and of separate pumps is superfluous. In the case of holders which are already installed, a heating device for the bottom cup can be incorporated without difficulty. In new containers, the improved arrangement entails very small additional cost. The heating device proper lies outside, and only externally heated liquid passes through it. This, in conjunction with the fact that the sealing liquid serves as heating liquid, state the patentees, simplifies the supervision of the operation.

Methanation of Carbon Monoxide. No. 340,822.

HUMPHREYS & GLASGOW, LTD., of Westminster (Assignees of PERRY, J. A., and FULWEILER, W. H., respectively, of Swarthmore and Wallingford, Pennsylvania).

No. 2760; Jan. 27, 1930. Convention date, May 6, 1929.

Among other objects, this invention is directed to the manufacture from blue water gas of a gas containing no carbon monoxide or a greatly reduced carbon monoxide content, and which will be sufficiently matchable in calorific power and specific gravity with the present coal or coke oven gas (with or without its present carbon monoxide content) to be used interchangeably with it (as a peak gas) without the necessity of readjustment of the burner appliance.

Blue water gas containing, for example, 51 p.ct. hydrogen and 38 p.ct. CO is produced in the ordinary way. This gas is then subjected to treatment for the removal of a portion of its carbon monoxide content. The blue water gas may be subjected to a low temperature, liquefying the carbon monoxide and separating it from the other constituents, or the blue water gas may be scrubbed with ammoniacal solutions of copper salts to absorb the carbon monoxide, and recovering the carbon monoxide by driving it off from the solution by heating. Other methods of removing the carbon monoxide from the blue gas may be employed in place of the above, which are given for illustration.

Sufficient carbon monoxide is removed from the blue water

gas to reduce the relation between the carbon monoxide and hydrogen contents to the approximate proportion of one to three. The treated blue water gas, after the carbon monoxide removal, is then passed over a suitable catalyst—as, for instance, nickel—at a somewhat elevated temperature, converting the carbon monoxide and hydrogen to methane and water vapour. The water vapour is condensed out, leaving the methane.

The carbon monoxide removed and recovered from the original blue water gas is passed with steam at an elevated temperature over a suitable catalyst—as, for instance, activated iron oxide—forming hydrogen and carbon dioxide. The carbon dioxide is removed, and the hydrogen is added to the methane produced above.

Instead of securing hydrogen to replace the carbon monoxide removed from blue water gas prior to methanation by passing the carbon monoxide with steam over an activated iron oxide catalyst, the following modified method may be employed.

The hot blast gases of the water gas generator may be used to heat a chamber filled with iron oxide (hæmatite ore), and the carbon monoxide, removed as described, may be passed through the iron oxide to reduce its surface to spongy iron. Then steam may be passed through the filling to react with the iron to form hydrogen and to re-oxidize the iron. The hydrogen is then added to the methanated gas.

Legal Intelligence

Lapse of a Trusted Official.

The story of an unhappy lapse by a trusted official was told at Dewsbury Police Court, last week, when Alfred Parkin (32), of Gomersal, foreman at the Spenborough Urban Council's Gasworks, pleaded "guilty" to stealing £24 10s. from the safe at the Gas Offices, and also to embezzling £22 18s. 5½d. It was stated that defendant entered the Department's service in January, 1915, as an apprentice, and had been employed there ever since, except for two war years when he was in the Navy. He was appointed foreman in April, 1927, and was regarded by the Gas Engineer as a thoroughly dependable man.

On Jan. 10 this year a sum of £24 13s. 3d. was put in the safe at the Gas Offices. A meter inspector who put the money in the safe was the only man who had the key to the safe, and kept this key on a ring, with various meter and other keys. Parkin, who was present when the money was put in the safe, called on the meter inspector the following day and asked for the loan of his keys, saying he had left his own keys at home and had been called on to release a coin that had been wedged in a meter. He was short of time and wished to avoid going home for his own keys. Garside handed over his keys, including that for the safe. The following morning it was found that Parkin had been away all night and had not reported for duty, and that £24 10s. was missing from the safe. Subsequent inquiries showed that Parkin had been embezzling small sums since May, 1930, most of the amounts taken being about 5s. at a time, totalling £22 18s. 5½d.

Prisoner said that members of his family offered to make full restitution.

In view of defendant's hitherto good character, the Bench bound him over under the supervision of the probation officer for twelve months, conditional on the £47 8s. 6d. being repaid, *plus* 30s. Court costs.

Trade Notes.

Order for Robert Dempster & Sons, Ltd.

The Ambleside Urban District Council have placed an order for a new gasholder with Messrs. Robert Dempster & Sons, Ltd., constructional engineers, of Elland.

"Ferrodor" Paints.

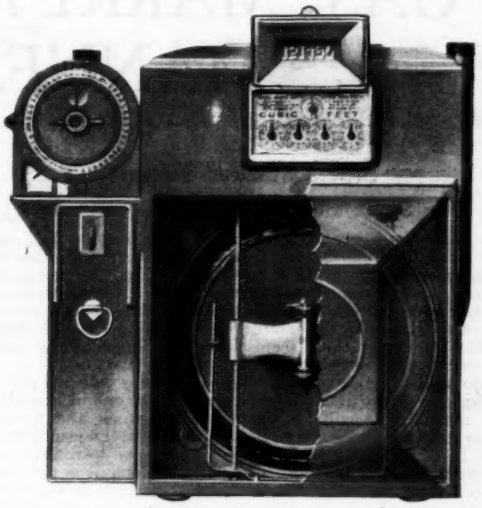
Messrs. Griffiths Bros. & Co., London, Ltd., have published a booklet describing some of their latest departures in natural finish "Ferrodor" paints. It is stated that the increasing use of "Ferrodor" paint by engineers all over the world is proof of its great value as a safeguard against corrosion.

Alexander Wright & Co., Ltd.

Following the death of Mr. John F. Simmance, we are informed that the work of Messrs. Alexander Wright & Co., Ltd., will continue to be carried on by the remaining members of the Board of Directors: Mr. J. W. Foreman, M.I.Mech.E.; Mrs. Kate Simmance, Director; and Mr. C. A. Goodwin, Secretary and Director. The many friends and customers are assured that every endeavour will be made to retain their confidence and goodwill.

"Bitumastic" Aluminium Solution.

For some time now Messrs. Wailes Dove Bitumastic, Ltd., have been engaged in experimental and research work with a view to producing an aluminium paint built up from a bituminous base. Their idea was to make a product which would be worthy of their trade mark "Bitumastic." They have at last succeeded in producing a material which comes up to the required high standard, and "Bitumastic" aluminium solution is now available to all. On application to the firm, shade card giving prices and covering capacities, will be sent, post free, to anyone interested.



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Nelson Meter Works, MANCHESTER.

Radford Meter Works, NOTTINGHAM.

TELEGRAMS: Sawer, Manchester. Sawer, Nottingham.

TELEPHONES: Manchester 2289 Collyhurst. Nottingham 75202.

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

Mr. Snowden's grave warning on Wednesday last on the financial outlook had a very restricting influence on the volume of business on the Stock Exchange during the remainder of the week, and prices in most sections weakened in consequence. British Funds fell sharply, quotations showing decreases of 1 to 1½, and while the uncertainty exists as to the Government's remedial intentions there seems little likelihood of any improvement in the present position.

In the midst of this gloomy atmosphere the value of gas stocks and shares showed little change, and the volume of business was about normal. It will be seen from the Stock and Share List that in several instances prices of recorded transactions were above last week's best, but the quotations were not varied. Improvements of 2 points occurred in Aldershot 4 p.ct. preference (*ex* div.) and Cape Town 4½ p.ct. debenture to 75-80 and 72-77 respectively, while Croydon sliding scale at 109-112 and Liverpool 5 p.ct. at 98-99 (at the Liverpool Exchange) showed increases of 1 point. On the other hand, Gas Light £1 units fell 3d. to 19s. 3d.-20s.3d., and at the local Exchange Newcastle £1 units weakened to 18s. 3d.-18s. 9d. At the time of writing both these stocks' prices include the full dividend for the past half-year.

The following were among the ordinary dividend announcements for the past week:

—	December Half Year.	Year 1930.	Year 1929.
	P.Ct.	P.Ct.	P.Ct.
Barnet	3½	7	7
Bristol	2½	5	5
European	3½*	5½*	5½*
Hornsey 3½ p.ct.	3	6	6
Newcastle	2¾	5½	5½
Sheffield	3¼	6½	6½
Southampton	2½	5	5
Sutton	4	8	8

* Tax free.

The Directors of the Portsmouth Gas Company are issuing by tender £80,000 ordinary consolidated stock at a minimum of £123, at which price the yield works out at £6 10s. 1d. An abridged prospectus appears elsewhere in this issue.

Contracts Advertised To-Day.

Benzole Plant.

The Gas Committee of the City of Plymouth invite tenders for benzole plant. [Advert. on p. 462.]

Coal.

The Plymouth Corporation invite tenders for the supply of coal. [Advert. on p. 462.]

Connersville Meter.

The Corporation of Oldham invite tenders for the supply of a Connersville meter. [Advert. on p. 464.]

Crane.

The Corporation of Oldham invite tenders for a travelling jib crane, &c. [Advert. on p. 464.]

Electric Generating Set.

The Oldham Gas-Works Committee invite tenders for the supply of an electric generating set. [Advert. on p. 464.]

Exhausters, Compressors, Boosters, &c.

The Corporation of Oldham invite tenders for the supply of exhausters and boosters. [Advert. on p. 464.]

Incandescent Mantles.

The Plymouth Corporation invite tenders for the supply of incandescent gas mantles. [Advert. on p. 462.]

Meters and Repairs.

The Mansfield Corporation invite tenders for the supply and repair of meters. [Advert. on p. 462.]

The Manchester Corporation invite tenders for new gas meters and the repair of old meters. [Advert. on p. 462.]

Oxide of Iron.

The Gas Committee of the Manchester Corporation invite tenders for new and spent oxide. [Advert. on p. 462.]

Pipes.

The Clacton Urban District Council invite tenders for cast-iron pipes and specials. [Advert. on p. 464.]

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Feb.* 16.

The values of tar products are as follows:

Pitch, 45s. per ton f.o.b.

Creosote, for export, about 5½d. per gallon f.o.b.

Pure toluole, 1s. 11d. to 2s. per gallon; pure benzole, about 1s. 8d. per gallon; solvent naphtha, 95/160, about 1s. 5d. per gallon; and pyridine bases, 3s. 6d. to 3s. 9d. per gallon.

All prices for spirits are *ex* sellers' works.

Tar Products in the Provinces.

Feb. 16.

The average prices of gas-works products during the week were: Gas-works tar, 18s. 6d. to 22s. 6d. Pitch—East Coast, 43s. to 43s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 43s. to 43s. 6d. f.o.b.* Toluole, naked, North, 1s. 6¾d. to 1s. 7¼d. Coal-tar crude naphtha, in bulk, North, 6¾d. to 7¼d. Solvent naphtha, naked, North, 1s. 2½d. to 1s. 3d. Heavy naphtha, North, 11d. to 1s. Creosote, in bulk, North, liquid and salty, 3⅜d. to 3⅝d.; low gravity, 1⅜d.; Scotland, 3⅜d. to 3⅝d. Heavy oils, in bulk, North, 5⅜d. to 5⅞d. Carbolic acid 60's., 1s. 2d. to 1s. 2½d. Naphthalene, £10 to £12. Salts, £3 to £5, bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Feb.* 14.

Conditions remain quiet in this area. Most products are obtainable in plentiful supplies, and quotations are easy.

Pitch.—Few orders are being placed. Export value is nominal at 42s. 6d. per ton f.o.b. Glasgow, and home price is about 42s. 6d. per ton f.o.r. works.

Refined tar to Ministry of Transport Specification is in better call for forward delivery. Quotations are unchanged at 2¼d. to 2¾d. per gallon for prompt and 2¾d. to 3d. per gallon for forward.

Creosote.—Values are unchanged. B.E.S.A. Specification is 2¾d. to 3d. per gallon; low gravity, 3¼d. to 3½d. per gallon; and neutral oil, 3d. to 3¼d. per gallon—all *ex* makers' works in bulk.

Cresylic.—Supply is greater than demand, but throughput is gradually improving. Pale, 97/99 p.ct. is 1s. 6d. to 1s. 7d. per gallon; dark, 97/99 p.ct., 1s. 5d. to 1s. 6d. per gallon; and pale, 90/100 p.ct., 1s. 8d. to 1s. 9d. per gallon; all f.o.r. works.

Crude naphtha continues steady at 4d. to 4½d. per gallon f.o.r. in bulk.

Solvent naphtha.—Stocks are accumulating, but meantime prices are unchanged. 90/160 is 1s. 2½d. to 1s. 3½d. per gallon; and 90/190, 1s. to 1s. 0½d. per gallon.

Motor benzole.—The production is small at present, and value is about 1s. 4d. per gallon *ex* works in bulk.

Pyridines remain dull. 90/160 is 3s. to 3s. 3d. per gallon.

Benzole Prices.

The following are considered to be the market prices at the present time:

	s. d.		s. d.	
Crude benzole	0 7½	to	0, 8½	per gallon at works
Motor ,,	1 3	,,	1 4	,, ,, ,,
Pure ,,	1 7½	,,	1 8½	,, ,, ,,

New Capital Issues.

Oxford and District Gas Company.—As will be seen from our advertisement columns, Messrs. A. & W. Richards, of 37, Walbrook, E.C. 4, are offering for sale by tender, on behalf of the Directors of the Oxford and District Gas Company, £51,000 5 p.ct. perpetual debenture stock, at a minimum price of issue of £98 per £100 stock, yielding at that price £5 2s. p.ct. The minimum amount of stock which will be allotted is £10; above this tenders may be in amounts or multiples of £1. Tenders must be received not later than 11 a.m. on Thursday, March 5.

Portsmouth Gas Company.—Tenders are invited by the Directors of the Portsmouth Gas Company for an issue of £80,000 ordinary consolidated stock, ranking for a standard dividend of 4 p.ct. (subject to the sliding scale) equally with the existing similar stock, on which the dividend now being paid is 8 p.ct. per annum. The minimum price of issue is £123 per £100 stock, yielding at that price £6 10s. 1d. p.ct., and tenders must be received not later than 12 noon on Thursday, Feb. 26. For further details of this call for tenders, see our advertisement columns.

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Feb. 13.	Rise or Fall on Week.	Transact'ns Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 5	5	5	Aldershot 5 p.c. max. C.	78—78*	..	..
522,992	,,	,,	4	4	Do. 4 p.c. Pref.	75—80*	+2	..
1,551,868	,,	Oct. 9	7⅞	7⅞	Alliance & Dublin Ord.	100—105	..	101½
374,000	,,	Jan. 8	4	4	Do. 4 p.c. Deb.	70—75	..	..
522,655	,,	Aug. 28	7	7	Barnet Ord. 7 p.c.	112—117	..	115½—116½
300,000	1	Oct. 23	1/4½	1/7½	Bombay, Ltd.	15/6—17/6	..	15/6
174,500	10	Aug. 14	9	9	Bournemouth 5 p.c.	14½—15½	..	..
500,050	10	,,	7	7	Do. B 7 p.c.	12½—13	..	..
439,160	10	,,	6	6	Do. Pref. 6 p.c.	11—11½	..	..
50,000	Stk.	Dec. 18	3	3	Do. 3 p.c. Deb.	60—63	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	81—84	..	..
857,900	,,	Aug. 28	7½	7½	Brighton & Hove 6 p.c. Con.	112—117	..	..
871,880	,,	,,	6½	6½	Do. 5 p.c. Con.	102—105	..	..
1,287,500	,,	July 24	5	5	Bristol 5 p.c. max.	93—95a	..	..
855,000	,,	Sept. 25	8	7	British Ord.	110—115	..	113½—114½
100,000	,,	Dec. 18	7	7	Do. 7 p.c. Pref.	109—114	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	74—77	..	..
450 000	,,	,,	5	5	Do. 5 p.c. Red. Deb.	95—98	..	..
160,000	,,	Jan. 8	5	5	Cambridge 5 p.c. Deb.	95—98	..	..
100,000	10	Dec. 4	10	6	Cape Town, Ltd.	9—10	−¼	9
100,000	10	Nov. 6	4½	4½	Do. 4½ p.c. Pref.	6¾—7½	..	..
150,000	Stk.	Dec. 18	4½	4½	Do. 4½ p.c. Deb.	72—77	+2	74½
626,860	,,	July 24	6	6	Cardiff Con. Ord.	97—100	..	..
237,860	,,	Jan. 8	7½	7½	Do. 7½ p.c. Red. Deb.	97—100	..	..
157,150	,,	Aug. 14	6½	5	Chester 5 p.c. Ord.	86—91b	..	..
98,936	1	Oct. 9	12/-	†2/-	Colombo, Ltd. Ord.	32/—34/-	..	..
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref.	18/—20/-	..	..
609,204	1	Oct. 9	1/9½	1/4½	Colonial Gas Assn. Ltd. Ord	16/6—18/6	..	..
296,053	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	18/—20/-	..	..
2,078,280	Stk.	July 24	7	6	Commercial Ord.	95—98	..	96½—97½
475,000	,,	Dec. 18	3	3	Do. 3 p.c. Deb.	57—60	..	..
787,550	,,	Aug. 14	7	7	Croydon sliding scale	109—112	+1	110—111½
453,100	,,	,,	5	5	Do. max. div.	84—87	..	85—85½
542,270	,,	Aug. 14	10	7	Derby Con.	115—125a	..	..
55,000	,,	Dec. 18	4	4	Do. Deb.	65—70a	..	..
209,000	,,	Aug. 28	5	5	East Hull Ord. 5 p.c.	72—75	..	..
1,002,180	,,	Sept. 25	17g	14	European, Ltd.	100—110	..	98½—102
18,953,033	,,	July 24	5g	5g	Gas Light & Coke 4 p.c. Ord.	19/3—20/3f	—/3	19/4½—20/3
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	65—67	..	65½—66½
4,294,891	,,	,,	4	4	Do. 4 p.c. Con. Pref.	79—82	..	81—82
5,694,095	,,	Dec. 18	3	3	Do. 3 p.c. Con. Deb.	61—64	..	62—63½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb.	101—104	..	102—103
161,480	,,	Sept. 11	10	10	Harrogate Cons. 10 p.c. max.	162—167	..	..
82,500	,,	Aug. 28	7	7	Hastings & St. L. 5 p.c. Conv.	98—103	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	82—85	..	..
70,000	10	Oct. 9	8	10	Hongkong & China, Ltd.	13—14	..	..
218,200	Stk.	Aug. 14	6	6	Hornsey Con. 3½ p.c.	88—91	..	..
2,434,594	,,	Nov. 6	25	15	Imperial Continental Cap.	355 375	..	360—371
223,180	,,	Feb. 5	3½	3½	Do. 3½ p.c. Red. Deb.	78—83*	..	..
235,242	,,	Aug. 14	8½	8½	Lea Bridge 5 p.c. Ord.	127—132	..	..
2,145,907	,,	Aug. 14	6	6	Liverpool 5 p.c. Ord.	98—99b	+1	..
600,000	,,	Sept. 25	7	7	Do. 7 p.c. Red. Pref.	99—101b	..	..
165,736	,,	Aug. 28	8	9	Maidstone 5 p.c. Cap.	123—128	..	..
68,480	,,	Dec. 18	3	3	Do. 3 p.c. Deb.	54—57	..	..
75,000	5	Dec. 4	†10	†10	Malta & Mediterranean	6—6½	+¼	6½
392,000	—	Oct. 1	5½	5½	Metrop'litan (of Melbourne) 5½ p.c. Red. Deb.	88—91	..	..
675,000	Stk.	Nov. 20	†8	†6	Montevideo, Ltd.	95—105	..	95
3,061,815	,,	July 24	5½	5	Newcastle & Gateshead Con.	18/3—18/9xf	—/6	..
682,856	,,	,,	4	4	Do. 4 p.c. Pref.	73—74d	..	..
691,705	,,	Jan. 8	3½	3½	Do. 3½ p.c. Deb.	67½—68½d	..	..
277,285	,,	Nov. 5	5	5	Do. 5 p.c. Red. Deb.	98—100d	..	..
169,940	,,	Aug. 28	7½	7½	North Middlesex 6 p.c. Con.	115—120	..	..
396,160	,,	Feb. 5	5	5	Northampton 5 p.c. max.	74—79*	..	..
300,000	,,	Nov. 20	7	9	Oriental, Ltd.	104—109	..	..
60,000	5	18 My., '15	—	—	Ottoman	0—¼	..	..
205,162	Stk.	Dec. 18	8	8	Plym'th & Stonehouse 5 p.c.	107 112	..	..
424,416	,,	Aug. 28	8	8	Portsm'th Con. Stk. 4 p.c. Std	115—120	..	..
241,446	,,	,,	5	5	Do. 5 p.c. max.	80—83	..	..
686,312	Stk.	Jan. 22	4	4	Primitiva 4 p.c. Rd. Db. 1911	82—85*	..	..
389,813	,,	Dec. 18	4	4	Do. 4 p.c. Cons. Deb.	83—86	..	..
150,000	10	Sept. 25	6	6	San Paulo 6 p.c. Pref.	8½—8¾	..	..
1,736,968	Stk.	Aug. 28	6½	6½	Sheffield Cons.	105—107e	..	..
95,000	,,	Jan. 8	4	4	Do. 4 p.c. Deb.	77—79e	..	..
90,000	10	June 5	†4	†5	South African	4—6	..	..
6 709.895	Stk.	Feb. 5	5	7½	South Met. Ord.	103—106*	..	103¾—105
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	111—114*	..	114
1,895,445	,,	Jan. 8	3	3	Do. 3 p.c. Deb.	60—63	..	61½—62½
734,000	,,	Sept. 11	6½	6½	Do. 6½ p.c. Red. Db.	99—102	..	..
91,500	,,	Aug. 14	8½	8½	South Shields Con.	110—111d	..	..
1,543,795	,,	July 24	6½	6½	South Suburban Ord. 5 p.c.	102—105	..	..
668,837	,,	Dec. 18	5	5	Do. 5 p.c. Deb.	99—102	..	101
647,740	,,	Aug. 28	5	5	Southampton Ord. 5 p.c. max.	75—78	..	..
121,275	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	75—78	..	..
179,014	,,	July 24	8	8	Sutton Ord.	120—130	..	..
94,500	,,	Jan. 8	5	5	Do. 5 p.c. Deb.	96—99	..	..
250,000	,,	Aug. 28	7	7	Swansea 7 p.c. Red. Pref.	98—101	..	..
200,000	,,	Dec. 18	6½	6½	Do. 6½ p.c. Red. Deb.	100—103	..	..
1,076,490	,,	July 24	6⅞	6⅞	Tottenham District Ord.	103 - 107	..	..
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	103—106	..	105½
199,005	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	77—80	..	79¾
85,701	,,	Sept. 25	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	74—79	..	..
310,694	,,	Aug. 28	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	97—102	..	..
88,330	,,	,,	5	5	Do. 5 p.c. pref.	90—95	..	..
1,322,220	,,	July 10	—	7	Wandsworth, Wimbledon, and Epsom Cons.	112—115	..	113—114¾
426,000	,,	,,	5	5	Do. 5 p.c. Pref.	95—98	..	..
1,013,464	,,	Dec. 18	5	5	Do. 5 p.c. Deb.	100—103	..	102½

Quotations at :—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g.*—Paid on £10 Shares. * Ex. div. † Paid free of income-tax. ; For year. § Div. = 10 p.ct. p.a. less tax and less tax on interim dividend.

STOCK ISSUES.

By Order of the Directors.

NEW ISSUE OF CAPITAL

Under the Powers of the Chichester Gas Order, 1906.

THE CITY OF CHICHESTER GAS COMPANY.

(Incorporated 1868.)

THE Directors invite Application for an ISSUE BY TENDER of £2500 "C" CAPITAL STOCK (ranking for a Maximum Dividend of £7 per cent. per annum).

Minimum Price of Issue, £102 per £100.

Prospectus and Form of Tender (which latter must be sent in by 11 a.m. on Thursday, the 5th of March, 1931) may be obtained from the SECRETARY, at the COMPANY'S OFFICES, STOCKBRIDGE ROAD, CHICHESTER.

By Order of the Directors.

THE OXFORD AND DISTRICT GAS COMPANY.

Messrs. A. & W. RICHARDS

are Instructed to OFFER FOR SALE BY TENDER

£51,000

FIVE PER CENT. PERPETUAL DEBENTURE STOCK.

Minimum Price of Issue, £98 per £100.

Yielding at that Price, £5 2s. per cent.

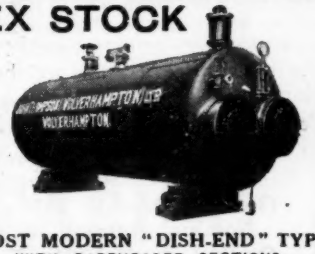
The Net Revenue of the Company last year was sufficient to cover the interest on the Loan Capital (including the present Issue) more than five times.

Prospectus and Form of Tender (which latter must be sent in by 11 o'clock on Thursday, March 5) may be obtained of A. & W. RICHARDS, 17, WALBROOK, E.C. 4.

NEW "THOMPSON"

BOILERS

EX STOCK



MOST MODERN "DISH-END" TYPE

WITH CORRUGATED SECTIONS.

	W.P.	Shop No.
One 30 ft. × 9 ft. 3 ins. ×	200 lbs.	6948
Two 30 ft. × 9 ft. 3 ins. ×	160 lbs.	6848/9
One 30 ft. × 9 ft. 3 ins. ×	120 lbs.	7012
Two 30 ft. × 8 ft. 6 ins. ×	160 lbs.	6970/1
Two 30 ft. × 8 ft. 6 ins. ×	160 lbs.	6983/4
One 30 ft. × 8 ft. 3 ins. ×	120 lbs.	6982
One 30 ft. × 7 ft. 6 ins. ×	120 lbs.	6945
One 28 ft. × 7 ft. 6 ins. ×	160 lbs.	6785
Two 24 ft. × 6 ft. 6 ins. ×	150 lbs.	6974/5
One 10 ft. × 4 ft. 0 ins. ×	120 lbs.	6443

All the above Boilers are built from "Siemens Martin" Acid Steel.

SUPERHEATERS AND PIPEWORK INSTALLATIONS.

Repairs to all types of Boilers by first-class men.

JOHN THOMPSON

(WOLVERHAMPTON) LTD.,

WOLVERHAMPTON, ENG.

Potential buyers in the Gas Industry can be reached more surely and economically through the "GAS JOURNAL" than by any other means.

BY ORDER OF THE DIRECTORS.

Last day for the receipt of Tenders, 26th FEBRUARY, 1931, at noon.

PORTSMOUTH GAS COMPANY

(Incorporated by Act of Parliament 1821.)

Directors:
T. H. F. LAPTHORN, J.P., *Chairman.*
W. GILLMAN, J.P., *Deputy Chairman.*
CAPTAIN R. J. E. BAKER, B.A.
F. E. BEDDOW, D.Sc., PH.D.
W. DOIG GIBB, O.B.E., M.INST.C.E.

Auditors:
EDMONDS, CLOVER & ACKERY, *Chartered Accountants*, London, Portsmouth, Brighton, &c.

Engineer and General Manager:
T. CARMICHAEL, M.INST.MECH.E.

Secretary:
W. HEWITT, A.C.A.

Bankers:
LLOYDS BANK LIMITED, Commercial Road, Portsmouth.

SALE BY TENDER
OF
£80,000 ORDINARY CONSOLIDATED STOCK.

Ranking for a Standard Dividend of 4 per cent. per annum (subject to the Sliding Scale) equally with the existing similar Stock, on which the Dividend now being paid is 8 per cent. per annum.

MINIMUM PRICE OF ISSUE—£123 per £100 Stock, yielding at that price £6 10s. 1d. per cent.

ABRIDGED PROSPECTUS.

THE DIRECTORS OF THE PORTSMOUTH GAS COMPANY are prepared to receive **not later than 12 o'clock noon on Thursday, the 26th February, 1931,** tenders for the above Stock in amounts of not less than £10 in multiples of £5.

The Stock will be allotted to the persons tendering the highest price or prices, and in the event of the receipt of Tenders at or above the minimum price for a larger amount of Stock than that proposed to be issued, the Tenders at the lowest price accepted will be subject to a pro rata diminution.

Payment will be required as follows:—

On Application: 10 per cent. of the Nominal Amount of Stock applied for.

On 20th March, 1931: 10 per cent. of the Nominal Amount of Stock allotted.

On 30th April, 1931: The balance of the purchase money.

The Stock ranks for a Standard Dividend of 4 per cent. per annum with a Standard Selling Price (in the City of Portsmouth) of 11·8d. per Therm, provided that if the Company increases or reduces the price of gas above or below the Standard Price, the dividend must be reduced, or can be increased, by one-fifth of £1 per cent. per annum for each variation of one-fifth of a penny per Therm above or below the Standard Price. The Standard Price is subject to revision in the circumstances prescribed by the Gas Regulation Act, 1920. The present selling price of gas (in the City of Portsmouth) is 7d. per Therm, so that, by the operation of the sliding scale, **the Company is authorised to pay £8 16s. 0d. per cent. per annum on this Stock as compared with £8 0s. 0d. per cent. paid during the last three years. Except during the years 1918-1920 the dividend paid on the Company's Ordinary Capital has not, for over twenty-five years, been less than $7\frac{1}{8}$ per cent.**

The Stock now being issued is required to provide Capital for the general purposes of the Company, and the extension and development of the Manufacturing and Distributing Plant to meet the steadily growing demands for Gas.

The area in which the Company is authorised to supply Gas consists of the City of Portsmouth **(with the growing health and pleasure resort of Southsea),** and surrounding districts. The total area of supply covers 110 square miles, and the population is estimated at 300,000.

The accumulated Funds at 31st December, 1930, were as follows:

Reserve Fund	**£61,286**	**13 11**
Special Purposes Fund ...	**44,842**	**17 2**
Renewal Fund	**6,658**	**0 0**
	£112,787	**11 1**
Undivided Profit (after providing for final dividend £23,012 15 10 payable 2nd March, 1931)	**£45,025**	**10 11**
Total	**£157,813**	**2 0**

After contributing £22,500 from the profits of the Company to form the nucleus of the Workmen's Pension Fund, the accumulated reserves have increased from **£64,141** to **£157,813** (31st December, 1930) during the past ten years.

The price of Gas in the City of Portsmouth in 1914 was 2/4 per thousand cubic feet, and in 1930, 7d. per Therm, equivalent to 2/7½ per thousand cubic feet.

A Brokerage of one-half per cent. will be paid by the Company on allotments made in respect of applications bearing the stamp or name of a Broker, Banker, or other approved Agent.

Copies of the **Prospectus and Forms of Tender** may be obtained on application to the undersigned.

By order of the Board of Directors,

R. W. HEWITT,
Secretary.

Gas Offices,
The Square, Portsmouth.
12th February, 1931.

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,,	£133	,, ,,	£6	0s. 4d.	,,

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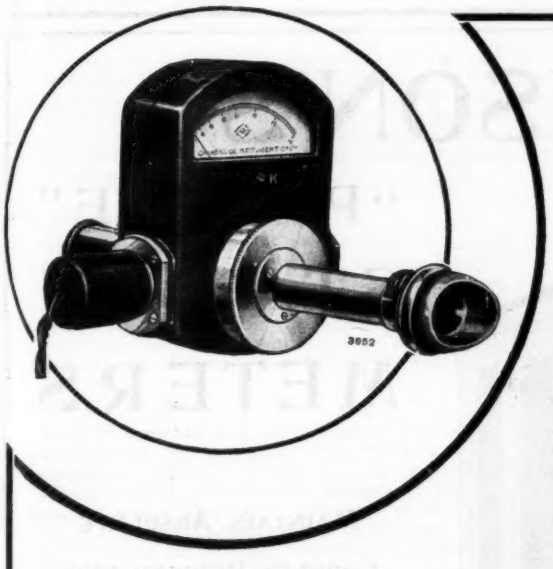

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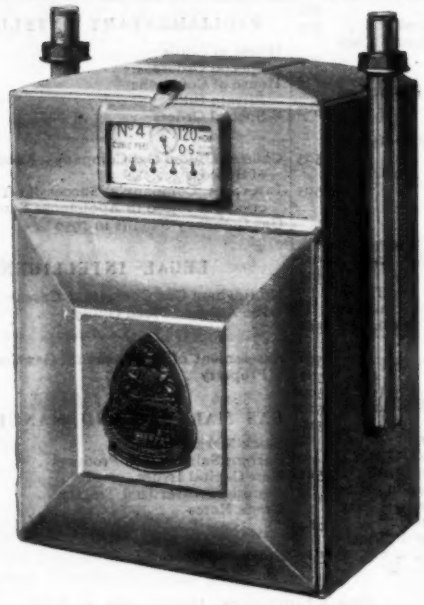

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